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PART I.

Original Contributions.

CASES OF NEURITIS OPTICA, NEURO-RETINITIS AND
RETINITIS.

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THE very instructive papers on these affections contributed by Mr. Hutchinson and Dr. J. H. Jackson, to recent numbers of this journal, have led me to collect and analyse my notes of cases of inflammation of the optic nerve and retina which have come under my own care or observation, chiefly at the Royal London Ophthalmic Hospital and Middlesex Hospital. The hindrances to systematic note-taking, inseparable from a large out-patient practice (arising out of the great number of persons to be treated in a limited time, and from their irregular attendance), have made these records in many respects incomplete; yet I venture to hope that they are not a wholly useless contribution to our acquaintance with a class of affections which (as Dr. Jackson has well shown) are scarcely less interesting to the general physician than they are to the ophthalmic

mic student, on account of the opportunity they afford us of seeing in the living eye, with great precision, the results of morbid processes identical with those which pursue their course unseen in the larger nerve-centres hidden from direct view; and for the valuable corroborative evidence they give us of the existence of various dyscrases, *e.g.*, uræmia, syphilis, tuberculosis, diphtheria.

The number of these cases (39), does not at all represent the frequency of neuritis optica, neuro-retinitis, and retinitis, because many cases were not recorded; and I have excluded all in which the ophthalmoscopic signs, although rendering an inflammatory origin very probable, were not by themselves sufficient to put this beyond doubt; as also all cases associated with albuminuria, having already published several of these in an earlier number. This series comprehends such cases only as came under my notice during the exudative period, or where the existing signs pointed unmistakably back to a past inflammatory stage.

I have found it convenient to classify the cases in the following four provisional groups, which comprise:—

I. Cases where the neuritis, &c., resulted directly from an external injury.

II. Cases where the neuritis, &c., was consecutive to an intracranial disorder.

III. Cases of neuritis, &c., accompanying a dyscrasia, whether due to the entrance into the body from without of a specific materies morbi, *e.g.*, syphilis and diphtheria, or to the generation of morbid conditions in the body, such as constitute uræmia, chlorosis, rheumatism, spanæmia.

IV. Miscellaneous cases not referable to any of the foregoing groups.

As long as the idea that light-shyness, and pain are necessary symptoms of retinitis, continues to be entertained, we cannot too frequently insist that these are not essential phenomena, but they signify the participation by other structures in the inflammatory process; for in confir-

mation of the opinion expressed long since by Mackenzie (at a time when the existent methods of investigation did not allow him to give a positive proof of it), we now know by actual inspection of the living eye, that retinitis and neuritis may and often do run their course without any photophobia, outward redness, and pain, and without the iritic exudations described by Sir W. Lawrence. In fine, inflammation of the optic nerve and retina are not necessarily attended by any outward manifestations of disease, except a dilated and sluggish or motionless pupil, when atrophy of the nervous tissues has resulted.

Instead of hyperæsthesia retinae, there is blunted sensitiveness; the bright illumination of the retina with the ophthalmoscopic mirror is borne without distress; patients tell us that they see things indistinctly, as if through a mist, and this when the ocular media are so transparent that we can accurately discern the nerve and retina. Where the visual acuity returns, it is reasonably presumable that its diminution did not depend on grave structural alterations in the bacillary and conal elements (since we have no anatomical observations supporting the idea that these, when destroyed, can be regenerated); but that it was (as it is always mainly) caused by the arrest of the incident light in the hazy inner strata of the retina, and by molecular disturbances in their elementary nerve-tissues, disordering their functions. In other words the lessened sensibility of the retina is due to opacity of the inner layers, whereby the incident light is barred out from the rods and cones; to disorder or suspension of the influences, whatever these may be, which the inner granules and the nerve-cells of the ganglionic stratum exert on the molecular changes transmitted through them from the rods and cones; and to diminished or lost conductiveness of the internuncial nervous fibres.

The essential ophthalmoscopic sign of inflammation of the optic nerve and retina is opaque swelling, accompanied with vascular turgescence. And the differential

diagnosis of the several forms of neuritis, &c., is to be found in differences in the amount and colour of the opacity; in the degree and kind of the swelling, and the extent of the vascular turgor; in the predominance of some of these phenomena, and the super-addition of what may be termed accidental phenomena (*e.g.*, extravasations of blood, and sundry appearances, marking retrogressive metamorphoses of these and various inflammatory products); and lastly, in the way in which these marks are combined and grouped.

I. *Group.* I have seen very few cases where neuritis or retinitis could be fairly considered the immediate consequence of a direct injury, and I have notes of two such only. In one of these the neuro-retinitis was only part of an extensive ophthalmia; in both, the stress of the inflammation fell in the nerve, and the retina was only slightly involved, and in neither were there any hæmorrhages.

CASE I.—*Neuritis after a Blow.*

A tall blonde, æt. 20, struck her left brow sharply against a desk. At the moment she was not much hurt, but aching pain above the left eye soon followed, and, in consequence of some visual defect in this eye, she found herself obliged to turn her head towards the left when she wished to see things in this direction. At the end of a week the defect had so much increased that she could not discern her hand, but two weeks later, when she came to the Royal London Ophthalmic Hospital, she could count my fingers at a few inches distance directly in front of the eye. The optic nerve and a narrow ring of the surrounding retina were swollen and opaque, so that the arteries were wholly hidden, and the veins appeared to end at the surface of the disc, while in the transparent part of the retina they were observed to be turgid and tortuous.

She was a lucifer-packer, but told me that neither she nor any of the other factory girls had ever suffered in health from this work. Three years before she had attended the London Hospital for glandular swellings in the neck and sore throat. I

did not find any scars in the fauces or other evidence of syphilis, which she denied ever to have had.

CASE II.—*Neuro-Retinitis and Sub-Retinal Exudation after a Blow.*

An artisan, æt. 22, was struck by a large splinter of iron on the temporal side of the left eye-ball, which it bruised but did not pierce. This was followed by redness and myodesopia; the former soon passed off, and the latter was replaced by a general dimness of this eye. Eighteen months afterwards he came under my care at the Royal London Ophthalmic Hospital. The anterior and posterior conjunctival veins were swollen; the optic nerve was red and opaque, and from its upper and temporal margins radiated two silvery opaque bands of retina slightly separated from the choroid. The vitreous humour near these was cloudy.

II. *Group.*—In most of the cases belonging here, the signs were restricted to the optic nerve, or only slightly overstepped its margin into the retina. The distinctive characters of Neuritis descendens (opaque, greyish-white swelling of the papilla, hiding the lamina cribrosa, and more or less concealing the vasa centralia, extending into the surrounding retina, and masking the margin of the disc; a form aptly called by Mr. Hutchinson the *woolly* nerve); as also those of the “Stauing’s papilla” (considerable, steep swelling of the papilla, with but slight opacity and much venous turgor), were not so frequently observed as mixed forms.

The cases have been very few (three only), where, after making an ophthalmoscopic diagnosis of neuritis during the patient’s life, I have had an opportunity of learning, by *post-mortem* examination, the exact nature and seat of the intra-cranial disease. In one of these, where the ophthalmoscopic signs were those of neuritis desc, I found a sarcoma growing from the basis cranii, and implicating the cavernous sinus, unaccompanied by any appearance of meningitis, or inflammation of other structures inside the

skull. In a second case, a "Stauving's papilla" was associated with a large gummy tumour, in the middle fossa of the skull and orbit; and in the third, recorded below, a "Stauving's papilla," accompanied a post-ocular neuritis, meningitis, and node of the base of skull. These cases have taught me to be very cautious in forming an opinion of the nature of the disease inside the skull, from the ophthalmoscopic signs. Some of the patients, particularly the younger ones, had head symptoms pointing to meningitis; but in many the cranial mischief was too obscurely shadowed by its symptoms for me to hazard a conjecture respecting its nature. In one case neuritis followed sunstroke, in another it occurred in a healthy man, after watching an eclipse.

CASE III.—*Sunstroke, Strabismus, and Neuritis Optica.*

A woman, æt. 24, in good health, while standing in her garden with her head uncovered, exposed to the sun in July, suddenly felt violent pain through her temples. She sat down upon a chair, and in a few minutes fell off this on the ground; her left side was powerless. She said that she was never unconscious, but this is not quite certain, since it appeared from those who ran to her assistance that she was convulsed, and foamed. This was shortly followed by convergent squint, diplopia, and obscuration.

When I first saw her, at King's College Hospital, to which I was then Assistant-Surgeon, fourteen days after the seizure, both pupils were widely dilated, and motionless, and not the slightest perception of light remained. The only morbid appearances I could then discover were slight over-fulness of the retinal veins, and slight haziness of the optic nerves. Six months later both nerves exhibited the characteristic marks of advanced white atrophy.

CASE IV.—*Diplopia, great Pain above the Right Eye and in the Head, and Neuritis, after Watching a Solar Eclipse.*

A basket-maker, æt. 38, a few days after watching a solar eclipse in July, 1860, saw things double. After six weeks the diplopia disappeared, but during the whole of the following Sep-

tember he had great pain above the right eye and in the crown of the head. This was succeeded by total extinction of sight, which lasted fourteen days, when quantitative perception of light returned; and November 6th, when he first came to the Royal London Ophthalmic Hospital, he could distinguish between a blank and a printed page, and imperfectly recognize large objects, as a finger or a pen. His visual field was a small trefoil or three-lobed figure, and the point of greatest distinctness was excentric.

The optic nerve was hyperæmic and hazy, the retinal veins were swollen and tortuous, and the vitreous humour was cloudy. In December the nerve was pale and the vasa centralia were small. In June 1861 the nerve was white, its surface was slightly depressed, and the arteria was then very greatly diminished.

CASE V.—*Epileptic Fits (?) after a severe fright, followed by Neuritis Optica.*

A woman, æt. 22, while apparently in good health, was frightened by a cow; next week she had a fit which was followed by others. These occurred at first about once a month, and afterwards with increasing frequency until they happened almost daily. Subsequently the intervals again became much longer. Her sight also quickly failed, and nine months after the fright its sharpness was so reduced that she was obliged to be led to the hospital. She said that her right arm felt numb, although its tactile sensibility was not observed to be lowered, and she mentioned that before the fright she had sometimes had cramps in the legs.

The image of each optic nerve was confused, its colour greyish white, its surface slightly depressed, and its contour ragged. The vasa centralia, particularly the arteria, were diminished, and the neighbouring choroid was slightly atrophied.

CASE VI.—*Meningitis, Neuritis Optica Descendens.*

A delicate blonde, æt. 19, was brought to the Royal London Ophthalmic Hospital November 23, 1864, with very defective sight. With her right eye she could only distinguish letters in No. 20 J.; and with the left read short words in No. 4 J.

Both optic nerves were very swollen, and greyish-white. They were good examples of what Mr. Hutchinson aptly calls the woolly nerve. The opacity ran for a short distance into the surrounding retina, hiding the contour of the nerve, and ceasing with a tolerably distinct edge. The vasa centralia seemed to end taperingly at the centre of the disc upon its inner surface, and they were frequently lost to view in the opaque tissue. The remainder of the retina was transparent, and its veins were very swollen.

Although very thin, her mother said she had been very stout as a school girl. Her catamenia appeared at fourteen, and after six or seven times they ceased, and never recurred. Her health did not at first seem to suffer, but in her eighteenth year she began to have frequent and severe pain in the head, chiefly in the crown, and her memory was noticed to be less good than before. About the same time also she began to retch, and this, at first, once every three weeks or month. Six months after the beginning of these symptoms, her sight, previously good, began to fail, and at this time, for several weeks, her left eye squinted outwards.

I transferred her to the Middlesex Hospital, where she remained during several months under Dr. Stewart's care, her symptoms being headache, retching, pain in the lower part of the belly, and delirium. This latter was never violent. She always replied pertinently when spoken to, but when left alone she lay apparently hardly conscious of what was passing in the ward, muttering bitter reproaches against herself for wicked actions which it was quite impossible she could ever have done. After some months the delirium ceased, and she slowly regained flesh and strength, so that she could walk alone, and she left the hospital 31st July, 1865. The optic nerves were still swollen, very white, but less opaque. Both eyes retained a slight quantitative perception of light.

CASE VII.—*Neuritis Optica Descendens.*

A stout, florid, maid servant, æt. 23, was brought to me at the Royal London Ophthalmic Hospital March 7th, 1866. She could then only spell short words in No. 16 (Jaeger's types). Her sight had begun to fail at Christmas, and about that time she also

began to suffer from frequent headaches. These still continued; the pain was severe, but not localized. She walked with a peculiar shuffle, which was less noticeable when she went quickly, and which appeared to proceed from a want of co-ordinating power, rather than from any deficiency of muscular force. She had not menstruated for several months.

Both optic nerves were swollen, and of an opaque grey colour. The right nerve was also encircled by a belt of cloudy retina (twice as broad as the diameter of the disc), streaked with radiating red brushes of extravasated blood, and dull grey splashes. Within this opaque area the arteria centralis and the choroid were completely obscured, and the retinal veins, turgid and tortuous, were lost to view wherever they dipped from the inner retinal surface. In the left eye the opaque retinal belt around the nerve was narrower, the retinal veins were less swollen, and there were not any hæmorrhages.

As I could not take her into the Royal London Ophthalmic Hospital, I passed her into the Middlesex Hospital, where she remained under Dr. Stewart's care until the following August. During this time I frequently examined her, and found that, while the ophthalmoscopic signs scarcely altered, her sight steadily diminished. The headaches gradually subsided, and the shuffle also disappeared.

I next saw her January 13th, 1867. The optic nerves were then pure white, their outlines were blurred, and the vasa centralia were very small, the artery particularly. V = o, or perhaps slight central qt. p. l.

CASE VIII.—*Meningitis? Double Neuritis Optica.*

A stout, hale-looking woman, æt. 36, was brought to the hospital 21st October, 1859, perfectly blind. She told us that in 1854, after miscarrying, she had had a severe illness, with great headache and delirium. The doctor called it brain fever; he bled her twice, cupped her between the shoulders, put leeches several times on her temples, and had her head twice shaved. During this illness she lost her sight. Once before the miscarriage she had seen "a black cloud, that broke up into a shower of stars and blacks." She had not menstruated for three years.

The pupils were large and motionless. Both optic nerves were dull-white; the vasa centralia were small, and the arteries extremely so; the veins were very tortuous.

CASE IX.—*Meningitis? Double Neuritis Optica.*

A tippling leather-dresser was suddenly seized with pain darting from the occiput to the forehead. It was so severe that he kept his bed, and was leeches and blistered by his doctor. During this time his sight grew dim, and three weeks after the beginning of the attack, on coming to the Royal London Ophthalmic Hospital, he only read No. 16 J. with the right eye, and No. 19 J. with the left.

The pupils were large and sluggish. Both optic nerves were hyperæmic and opaque, and encircled by a belt of hazy retina, outside which the veins were seen much distended. In the right nerve there was also a minute apoplexy.

CASE X.—*Hemiplegia of the Right Side—Neuritis Optica in the Right Eye, at first limited to half of the disc.*

A hard-drinking painter, 66 years old, had hemiplegia of the right side, with defective speech, in 1853. He recovered, and in 1859 had another attack on the right side, which was also found to be hyperæsthetic, but his speech was not affected. His limbs slowly regained strength, but the hyperæsthesia was succeeded by numbness, which still existed in September, 1860, when I saw him, six months before which his right eye became suddenly uneasy, as if dust were in it, and this was followed by a little pain behind the eyeball and dimness.

With spectacles corresponding to his presbyopia, he read short words in No. 14 J. with this eye, but the visual field was small, and limited above by a wavy horizontal line, one inch above the central fixing point and the punctum cæcum.

The lower half of the optic nerve disc was swollen, and of a dull, opaque, grey colour. The opacity hid the corresponding part of the contour of the disc, and extended a short distance into the retina. The upper half of the disc was less hazy, but its contour was also confused. In the disc the artery was scarcely

discernible, and the image of the veins was broken and faint. In the upper hemisphere of the retina the veins were only slightly over-full, while in the lower half they were very turgid and varicose. Three months later the whole nerve disc was more swollen, the entire retina was hazy, and the veins in its upper and lower halves were equally swollen. These appearances continued without any appreciable change until January, 1861, when he passed from under my care. I heard that he died soon after of apoplexy.

CASE XI.—*Neuritis Optica in the Right Eye, followed by Hemiplegia.*

A corpulent man, æt. 61, broken-spirited by a great reverse of fortune, and harrassed by bronchitis, came to the Royal London Ophthalmic Hospital 4th March, 1865. The sight of his right eye had been failing some time, and he could then only indistinctly recognize large, bright objects in the upper border of its visual field; the retina corresponding to the rest of the field retained only quantitative perception of light.

The optic nerve was hyperæmic, and so hazy that the vasa centralia appeared to end at its surface. The retina around the nerve was also hazy, while beyond this belt the veins were swollen, and unusually conspicuous. Above the nerve there was a circumscribed sub-retinal serous effusion.

He had headache and tinnitus, and severe pain behind the eyeballs. He could not lie on the left side of his head because this made him feel, he said, "half dead." I heard that he soon became hemiplegic, and died.

CASE XII.—*Cerebro-Spinal Disease—Double Neuritis Optica.*

A tall, thin man, æt. 56, was led to the Royal London Ophthalmic Hospital 13th May, 1862. His right eye retained only a feeble quantitative perception of light. The optic nerve and the retina around it for a space equal to its radius were of an opaque grey, the opacity diminishing peripherally. In the nerve disc the arteries were invisible, and the veins could only be seen in those parts of their course which were close to the surface.

He was scarcely able to walk, less from want of strength than from imperfect concert in the muscular movements. He com-

plained of distressing giddiness, and he was very restless and extremely irritable, but his memory and other mental faculties were not impaired. He said that four years previously after severe brow-ache he had become paraplegic, from which he partially recovered, and that shortly before coming to the hospital he had accidentally discovered the blindness of his left eye by chancing to close the right. I heard afterwards that his left eye became blind, and that he had unmistakeable signs of brain disease.

CASE XIII.—*Headache, Neuralgia in the Right Temple and Cheek, Neuritis Optica in the Right Eye.*

A woman, 35 years old, after suffering during three months from attacks of severe pain in the top of the head, attended with palpitation, was seized in one of these with dimness of the right eye, accompanied with neuralgia in the right temple and cheek, and drowsiness. Five days after the accession of the dimness, when I first saw her at the Middlesex Hospital, 31st October, 1865, perception of light was extinct in this eye; its pupil was dilated and motionless. The optic nerve was swollen and cloudy, and at its centre there was a minute apoplexy. The retinal veins were very turgid. Leeches were put to the right temple, and she took Pot. Iod. gr. v 3 d. November 3.—The headache was less, and the drowsiness gone. 7th—Since the last visit she felt a commotion in the back of the head, with giddiness, and a copious watery flow from the nose. 10th—Less pain in the head, but a fresh retinal apoplexy. 21st—During the last three days she has bright sparks in this eye, which now has quantitative perception of light. 28th—The nerve is less opaque and the apoplexies are gone. She discerns my fingers held a few inches off in the temporal side of the field. December 22nd—The nerve is now white, the lamina cribrosa is too distinct, and the vasa centralia are very small.

CASE XIV.—“*Swelling’s Papilla,*” *post ocular, Orbital and Intracranial Neuritis Optica—Meningitis and Node at the Base of the Skull—Softening of Anterior Lobe of Left Cerebral Hemisphere.*

Very considerable and steep swelling of the intra-ocular end of the nerve, with but slight opacity, led me to infer the existence

of a tumour in the skull. Neuralgia of the 5th cranial nerve pointed to the neighbourhood of the Gasserian ganglion as its probable seat, and the occurrence of a chancre four years before, and latterly of pains in the bones, made it not unlikely that this tumour was a syphilitic node.

The post-mortem examination showed that the diagnosis, as far as it went, was correct, but it also revealed post ocular optic neuritis both inside the skull and in the orbit, in connection with which it should be noticed that the ophthalmoscopic picture was that of a "Stauning's papilla," and not that of neuritis optica descendens. Perhaps had the patient lived a little longer we should have seen the congestive swelling replaced by that considered typical of neuritis descendens.

A tall, thin, pale-faced lithographic printer, æt. 30, came to the Royal London Ophthalmic Hospital 16th January, 1867, complaining that he saw very imperfectly with his left eye, and I found that he could not read smaller type than No. 8 J. with it, and of this type short words only.

Its optic nerve was swollen; the swelling was considerable and very steep, as shown by the strong arching of the vasa centralia from the point where they first became visible at the inner surface of the disc to the margin of the latter, where they abruptly changed their direction in passing from the nerve to the retina. Although so swollen, the nerve-tissue was but slightly cloudy, so that the normal distinctness of the image of the vessels was only slightly damped. In the retina the veins were turgid and kinked, but no abnormal appearances were observed in the arteries.

The visual field was centripetally contracted. Measured at 8 inches distance it was a small polygon of $7\frac{1}{2}$ inches vertical, and $5\frac{1}{2}$ inches horizontal diameter, with the fixing point 2 inches from the bottom, and equi-distant from the outer and inner sides.

Excepting a chancre four years ago, since which he had had occasionally pain (which he thought rheumatic) in the bones, he said that he had never had any illness until the present, which began three months before he came to me with neuralgia in his left cheek. For this a decayed molar in the upper jaw was pulled out, which gave him a few days' ease, but the pain returned and grew worse in spite of the extraction of the remaining upper molars and the left lateral incisor tooth.

These particulars of his illness were elicited with difficulty, for he was very reticent and irritable. Suspecting an intracranial tumour, in order to watch him more closely than I could do at Moorfields, I transferred him next day to the Middlesex Hospital.

The neuralgia was always relieved by hypodermic injections of morphia, but he grew more irritable and after a few days took entirely to his bed. On February 5th the retinal veins were rather less swollen, and a slight increase of visual acuity was noted. On February 8th, although in but little pain, he was very excitable, the least noise in the ward startled him. He read No. 6 J.

10th.—At 9 o'clock, A.M., I found him confused; he answered my questions irrelevantly, and was too weak to sit up in bed, p. 72. In the night he had had three epileptic fits. Next night he had three similar fits, which were followed by a longer and deeper stupor; indeed at 12½ o'clock P.M. he was scarcely conscious; p. 80, and intermittent. His brother, who had been sent for, now told us that he had had several fits before he came to the Royal London Ophthalmic Hospital. Throughout the night of the 11th he had a quick succession of fits between which he remained in a stupor, scarcely taking notice when spoken to, but sometimes moving his limbs, particularly his arms, in a regular manner. His left was more convulsed than his right side, the arm most; the legs were stiffly straightened out, his lips foamed, and the contents of the bladder were expelled. Next morning the intervals between the fits were shortened to a few minutes, he was stertorous, and comatose, he retched occasionally, and he died the same night, 12th February.

At the examination of his body, made next day, we found the dura mater to adhere so tightly to the lower, outer, anterior and upper surfaces of the anterior lobe of the left cerebral hemisphere, that it came away from the bones and remained attached to the brain when this was lifted out of the skull. This lobe was very soft, almost diffuent, it fell to pieces notwithstanding great care in removing it, and the whole brain was less firm than normal.

The left optic nerve, from the foramen opticum backwards to the chiasma, was greyish, and about 2½ times as thick as the corresponding part of the right nerve. The swelling diminished from the foramen to the chiasma, the left side of which it only

slightly implicated. It was caused by the presence of immense numbers of small round and roundly oval cells packed between the bands of nerve-fibres. Much of this new cell-growth was more or less advanced in fatty degeneration. The right optic tract contrasted remarkably with the left, being softer, only half as broad, and much flatter. The sella turcica, and the hollow of the cavernous sinus were occupied by a thick, semi-translucent, firm mass which involved the pituitary body, and also covered the upper surface of the left petrosal bone, implicating the Gasserian ganglion and the three primary divisions of the fifth cranial nerve. This gummy mass chiefly consisted of small round cells (of the granulation cell type), one source of which appeared to be the connective tissue corpuscles of the dura mater, since these were found actively proliferating. The pituitary body was very hyperæmic, but not otherwise structurally altered. The orbital segment of the left optic nerve did not exhibit any roughly-appreciable morbid appearance in its posterior $\frac{3}{4}$, but at 4''' from the eyeball it began to enlarge and increased from here to the sclerotic canal. This swelling was found to depend on alterations in the nerve-trunk and in its sheath. An exudation, which in chromic acid preparations appeared in the form of a granular coagulum, with webs of fine fibres resembling those of coagulating fibrine, and numerous cells ranging from $\frac{1}{2}$ and up to 3 or 4 times the diameter of a red blood-disc, filled the meshes of the loose areolated tissue which occupies the interval between the inner and the outer sheaths. Similar morbid products were observed in the nerve-trunk. The septa were much thickened by masses of cells identical in appearance with those in the sheath, but there was less granular exudation. The blood-vessels were dilated. Both in the sheath and in the nerve-trunk the origin of the morbid cell-growth was distinctly traceable to proliferation of the connective tissue or its modification, the neuroglia.

The optic papilla, examined after hardening in a chromic acid solution, was found very much swollen. Its free surface projected unnaturally towards the vitreous humour, and its deep surface depressed the lamina cribrosa and made it unnaturally concave. The texture of the nerve was open, its tissues were separated, and their interstices were occupied by masses of exudation and of cells resembling those found in the intra-cranial segment of the nerve, and like them also referable to proliferation of the neu-

roglia. The venous system of the retina was dilated, but the other retinal tissues did not exhibit any noteworthy changes. The choroid immediately around the optic papilla was thickened with exudation.

The most interesting points in this case appear to me to be:—

The great progress of the inflammatory disease inside the skull before any very prominent cerebral symptoms manifested themselves.

The association of a “Stauung’s papilla” (usually regarded as pathognomonic of intra-cranial tumour) with an inflammatory affection of the membranes at the base of the skull, and with an indubitable coarse neuritis optica behind the eyeball, within the orbit and in the cranium.

The predominance of the neuritis in certain segments of the nerve, as shown by the great enlargement of the nerve from the foramen opticum to the chiasma, by its relative integrity between the foramen opticum and the spot where the arteria centralis enters it, and its swelling from this spot to the eyeball.

The fatty disintegration of the inflammatory products, and the absence of anything like histroid arrangement, proving their transitory character, and showing their affinity with the adventitious formations which compose the syphilitic gummata. Their derivation from the connective tissues, and the resistance of the nerve fibres, which explains the conductiveness of the apparently so greatly altered nerve-trunk.

The wasting of the right optic tract; another pathological proof of the decussation of the fibres in the chiasma.

III. *Group*.—Neuritis, &c., in connection with a dyscrasia.

In the five following cases in this group, distinct syphilitic symptoms of an early kind (rashes, or ulcerated throat) were present. The inflammation in four was restricted to the nerve. The fifth is remarkable for the

occurrence of frontal herpes, which was not, however, attended with any aggravation in the train of ocular symptoms. The opacity and swelling of the optic nerve were not so great as in neuritis descendens, and the opacity was greyer. In none were there any apoplexies.

CASE XV.—*Neuritis Optica.—Syphilitic Palmar Psoriasis, Ulcerated Throat and Tongue.*

November, 1865, a blonde, æt. 27, was transferred to my care by a colleague, at the Middlesex Hospital, who had treated her for a chest affection. The sight of her right eye had been slowly failing since spring, and when I saw her she could only spell short words in No. 20 J. with it.

The optic nerve was hyperæmic and opaque, and the vitreous humour near it was also hazy, and filled with fine gauzy opacities. The other eye was healthy.

I found she had palmar psoriasis, and an ulcerated throat and tongue; and she told me that she had had good health until November, 1864, when, shortly after rejoining her husband (a soldier, who had been four years absent from her on service), the rash, and other symptoms of syphilis, appeared.

CASE XVI.—*Neuritis Optica.—Syphilitic Psoriasis and Fissured Mouth.*

A man, æt. 37, the sight of whose right eye had been failing for 16 months, came to the Royal London Ophthalmic Hospital, 29th April, 1862. He could then only spell slowly words in No. 20 J.

The optic nerve was hyperæmic, swollen, and so opaque that the vasa centralia were only visible close to the inner surface of the nerve.

A slight synechia posterior told of a former iritis. He had psoriasis and a fissured mouth, and acknowledged to have had a chancre some months before.

CASE XVII.—*Neuro-retinitis and Herpes Frontalis three years after Iritis associated with a Scaly Syphilitic Rash.*

A clerk, æt. 35, who had been under my care three years before, for iritis, and a scaly syphilitic rash, returned to the

Royal London Ophthalmic Hospital, April 19, 1866, with great dimness of this eye. No. 6 J. was the smallest type he could spell with it.

Small dots of brown pigment upon the anterior capsule of the lens, and a limited synechia posterior spoke of the past iritis. The temporal half of the optic nerve-disc was red, hyperæmic, while the nasal half had a dull, stone-grey colour. There was a similar opaque blotch in the retina, just below the disc, which completely hid the branches of the vasa centralia that traversed it. A fine diffused haze, pervaded by delicate gauzy membranes, obscured the neighbouring part of the vitreous humour.

A few days later he had a scorching pain in the right brow which was followed next day by herpes, taking the course of the supra-orbital branches of the fifth nerve. It subsided, leaving scars and numbness; and no nutritional disturbance of the cornea or conjunctiva accompanied or followed the eruption.

The hyperæmia and exudation in the optic nerve and retina were slowly replaced by atrophy.

CASE XVIII.—*Neuritis Optica, a year after a Syphilitic Rash and Sore Throat.*

A woman, æt. 49, came to the Royal London Ophthalmic Hospital, 20th April, 1864, with considerably diminished visual acuity of both eyes, that of o. d. = $\frac{1}{3}$ S. of o. s. = $\frac{2}{3}$ S. Both optic nerves were hyperæmic, and slightly swollen. She dated the failure of her sight from the spring of 1863, when, having previously been in good health, she had a rash and a sore throat. I learned from the doctor who had attended her, that he had regarded these as syphilitic, and that her husband had shortly before had a chancre. Thousands of glittering motes rising before her eyes towards night were the first symptoms.

I saw her at long intervals, and a year later the left optic nerve had an opaque, greyish, flocculent appearance, in which the vasa centralia were completely hidden, while beyond the nerve, in the transparent retina, the veins, owing to their turgescence, were very conspicuous. The right optic nerve was hyperæmic, but not opaque. O. d. read No. 12 J., and o. s. spelled the same type.

CASE XIX.—*Neuritis Optica after a Chancre, Indurated Bubo, and Ulcerated Throat.*

A traveller, æt. 46, who had had chancre, indurated bubo, and ulcerated throat; and who drank eight pints of beer daily, and smoked two ounces of strong tobacco per week, finding his right eye defective, came several months afterwards, as the defect increased, to the Royal London Ophthalmic Hospital, November 18, 1865. With an effort he could then read No. 2 J. with each eye. The right optic nerve was pale, and the vasa centralia were rather small. The left optic nerve was hyperæmic, slightly swollen, and opaque, the image of the vasa centralia being confused; and in the transparent retina the veins were seen to be rather turgid. In December this nerve was less hazy and white, and No. 19 J. was the smallest type read with this eye.

The two following cases possibly throw some light on the paralyses which are not infrequently observed during the convalescence of patients from diphtheria. That of the palate might be fairly attributed to the direct extension of the inflammatory action from the faucial mucous membrane to the muscles, and perhaps in some instances this actually happens, but where the paralysis first makes its appearance some weeks after the attack, and when the patient is convalescent, this explanation does not hold. It is obviously inapplicable to distant paralyses, *e.g.*, of the external muscles of the eyeball and of the ciliary muscle, which more often come under the notice of the ophthalmic surgeon, and also to those of the limbs of which I had two examples not long since at the Royal London Ophthalmic Hospital. In such cases we can only suppose that the *materies morbi*, which produces the diphtheritic throat, also induces some morbid state of the nerves of the paralysed muscles, since we have no evidence that the muscular tissue is itself, in the first instance, affected; but what may be the nature of the affection of the nerves we have no direct means of ascertaining, nor do we certainly know what part of the nervous circuit is affected primarily, or

principally, the trunks or the peripheral plexuses. My colleague, Dr. Greenhow, informs me that in some cases of paralysis of the limbs, after diphtheria, the nerve-trunks have been found tender when pressed, which might signify an inflammatory condition of the nerve. Now this I have actually seen in the optic nerve. In the first case, which came under my notice in March of this year (1867), the interval between the diphtheritic attack and the first eye symptoms was so great that I hesitated to connect the neuritis with the diphtheria, but in the second case the interval was so short as to afford a very strong presumption of their causal connection.

CASE XX.—*Atrophy of the Optic Nerve from Inflammation after Diphtheria.*

A tall, slender girl, æt. 18, came to the Royal London Ophthalmic Hospital March 20th, 1867, with very considerable impairment of the sight of the left eye. She could not recognize any smaller letters than No. XL (Snellen) with it, and this not beyond six inches, fixing excentrically with the nasal side of the retina.

She told us that nine months previously, one day whilst at needlework, both her eyes felt dazzled, and for a few moments she could not see with either; then the sight of the right returned, but for a few minutes longer she could not see any objects with the left. Whether quantitative perception of light was lost is uncertain. After a little while the sight of this eye slightly improved, but she had never after been able to read with it.

About two years before this she had had diphtheria—not severely, for she did not entirely keep her bed. She was ill three weeks, and her brother, who had it at the same time, died of it.

The left optic nerve had a dull white colour. Its edge was slightly ragged and blurred. The vasa centralia were small, especially the artery. The lamina cribrosa was unnaturally distinct, and this up to the edge of the nerve-disc, but its details were not quite so sharply defined as they usually are in atropia simplex.

The right eye was healthy, and its visual acuity = $\frac{1}{1}$.

CASE XXI.—*Neuritis Optica during Convalescence from Diphtheria.*

A tall, thin, feeble, pallid girl, æt. 14, was brought by her mother to the Royal London Ophthalmic Hospital May 25th, 1867. With her left eye she could only read No. 14 (Jaeger), while with the right she read No. 1.

The optic nerves, particularly the right, were hyperæmic, and slightly hazy; and the retinal veins were very turgid and varicose.

Five weeks previously she had had a severe attack of diphtheria. Two weeks before she came to me she found that she could not thread a needle; and that from that time the visual obscuration had steadily increased.

I saw her only once again, July 10th, when the optic nerve was less opaque, but her V. remained as before.

In the five following cases anæmia from rapid child bearing, too long suckling, and leucorrhœa, was the only apparent cause of the neuritis. The glistening white spots and the hæmorrhages, so commonly met with in anæmic retinitis, were absent, and the urine in each case was found free from albumen.

CASE XXII.—*Neuro-retinitis—Great Weakness from Rapid Child-bearing, and too long Suckling.*

A woman, æt. 35, after suffering during several months from photopsiæ and occasional dimness of the left eye, accidentally discovered that its sight-sharpness was permanently lessened. She could still read large type with it, but a fortnight later, December 6, 1868, when she came to the hospital, she could not recognize the largest letters. The photopsiæ continued, and she felt a pricking pain in the eye.

The optic nerve was swollen, red, and hazy. The opacity extended into the retina for a short distance from the nerve, and produced a slight confusion of the image of the arteria centralis. Near the nerve the vitreous humour was also slightly turbid, and there were some small brown flocs in it here.

She was feeble, having had seven children in quick succession, and having suckled the youngest child during two years

until a week before she came to me. Her urine was tested for albumen, but none was found. Four months afterwards the optic nerve was no longer swollen, its redness was less, but it was still slightly hazy, and it was now encircled by a narrow ring of incompletely atrophied choroid.

CASE XXIII.—*Neuro-retinitis—Profuse Leucorrhœa.*

A tall blonde, æt. 36, came under my care at the Royal London Ophthalmic Hospital February 22nd, 1865. Her sight had been failing during six months, and the right eye had then only quantitative perception of light, while with the left eye she could still make out No. 16 J., slowly and with an effort.

The right optic nerve was hyperæmic, and it, and also a belt of neighbouring retina as broad as its radius, were hazy, the vasa centralia being hidden in this region wherever they left the surface, while in the transparent portion of the retina the veins were conspicuous by their turgescence. Similar, but less strongly marked, morbid appearances were seen in the left eye.

Her health was delicate. She had had a very profuse leucorrhœa during nine months, and her strength had latterly failed. She had three healthy children, and said that her sight had been weak in each pregnancy. No albumen was found in the urine, the sp. gr. of which was 1015°.

CASE XXIV.—*Neuritis Optica—Uterine Disorder.*

A saddle-stitcher, æt. 29, who worked from early morn until late at night, became alarmed by flashes and occasional obscurations of the left eye, accompanied with brow-ache, and a feeling of distension of the eyeballs. The obscuration soon lost its intermittent character and became permanent, the sight-sharpness decreasing rather quickly until on August 7th, 1860, when she first came under my care at the Royal London Ophthalmic Hospital, she could not spell No. 20 J. The optic nerve was very red, and its tissue was slightly cloudy, which rather confused its outlines. The retinal veins were very swollen and tortuous.

Her health was very delicate. She had a weak chest, dysmenorrhœa, leucorrhœa, and occasional hæmaturia, with dif-

ficult micturition, which made me suspect a stone in the bladder, but I could not detect one. Her urine was tested several times, and on each occasion was free from albumen. Leeches were put on the temple, and she took small doses of corrosive sublimate. Under this treatment her sight slightly improved, and September 4th, 1860, she read No. 16 J. I next saw her April 11th, 1861, at which time the optic was still slightly hyperæmic, but its tissue was no longer hazy. No further improvement of vision was noted.

CASE XXV.—*Neuritis—Anæmia.*

A tall, pale girl, æt. 14, who had consulted me in March, 1863, for hebetudo and hypermetropia ($\text{Hm} = \frac{1}{20}$), was again brought to the Royal London Ophthalmic Hospital November 5th, 1864, this time with very considerable diminution of visual acuity. She read only short words in No. 16 J., and this slowly.

The optic nerves were hyperæmic. I thought them slightly swollen, and the larger retinal vessels were over-distended. She was slightly intolerant of light, knitting her brows, and complained of lassitude and headache. She continued under my observation until November, 1865, during which time there was little alteration in the ophthalmoscopic signs, but a gradual decrease of visual acuity. Her health improved slightly after the appearance of the catamenia, in the spring of 1865.

CASE XXVI.—*Neuro-retinitis—Chlorosis.*

A short, very chlorotic umbrella-stitcher, æt. 26, came to the hospital July 9th, 1864, on account of failing sight. At that time V. o.d. = $\frac{1}{17}$, o.s. = $\frac{1}{13}$ (Snellen).

The optic nerves were swollen, and their tissue was so hazy that the larger branches of the vasa centralia appeared to end at the surface of the disc. This haziness ran beyond the nerves for a short space into the retina, and beyond this three large white bands in the right eye, and a single one in the left, radiated for a distance rather more than the diameter of the disc in the retina. From their fine striation and brush-like edges, these were judged to be dark nerve-fibres.

She took gr. $\frac{1}{8}$ of corrosive sublimate in dec. cinch. ter die,

and under this treatment the haziness of the nerve and of the retina slowly disappeared, and the white patches of nerve-fibres became plainer. Ten months after her first visit V. o.d. No. 14 J., o.s. No. 2 J. All inflammatory opacity had disappeared; the contour of each nerve was slightly ragged; and two white spots, fringed with an excess of pigment, were noticed in the choroid at some distance from the left nerve.

CASE XXVII.—*Neuritis Optica—Anæmia.*

A stout, but not healthy, over-worked housemaid, æt. 22, became conscious of a slight defect in her sight, and by closing her eyes alternately she found that objects seen with her right eye were overhung with a faint haze. A week later she came to the Royal London Ophthalmic Hospital, November 14, 1865, when we found that she could read No. 2 J. correctly after looking intently at it for a few moments, and even No. 1 J. but slowly and blunderingly. The optic nerve was tumid, its tissue opaque, its contour confused. Within it the outlines of the large vessels were very indistinct, and the smaller branches of the artery and veins were invisible, while beyond it, in the transparent retina, the venous network was conspicuous by its turgescence. The vitreous humour was pervaded by fine gauzy webs.

CASE XXVIII.—*Neuritis—Pulmonary Phthisis.*

A brunette, æt. 50, whose sight had been slowly failing for some years, came to the Royal London Ophthalmic Hospital February 17th, 1864. At that time she could not read any smaller type than No. 14 J. I regret that I have not any note of the ophthalmoscopic appearances. She was a thin delicate woman, and she had been several times a patient at the Victoria Park Hospital for disease of the chest. Her pulse intermitted, the heart's impulse was very forcible, and its second sound was accentuated.

When I again saw her, May 17th, 1865, a further diminution of her visual acuity was noted; she could then only read No. 18 J. at six inches distance. The optic nerves were too red, slightly swollen, and their outlines were slightly confused. The retinal vessels were turgid.

October 18th—She could only read No. 19 J., the right nerve was, however, more transparent, but the left was slightly hazy. November 14th—The hyperæmia and the haziness were less. V. No. 16 J.

The three patients whose cases next follow had had rheumatic fever, but a long interval (of 7, 5, and 4 years) occurred between this and the neuritis. One complained of shortness of breath, but in none was any valvular disease of the heart discovered with the stethoscope. None, at the time I saw them, had any other manifestations of a rheumatic diathesis, and the connection of the neuritis with this remains doubtful.

CASE XXIX.—*Atrophia Nervi Opt. ex. Infl.—Sequelæ of Circumscribed Choroiditis. Rheumatic Fever.*

A coffee-house keeper, æt. 33, a stout brunette, came to the Royal London Ophthalmic Hospital December 12th, 1863, on account of very imperfect sight with the right eye. She could not read smaller type than No. 12 J., and with the left eye no smaller than No. 8.

With the exception of an attack of rheumatic fever five years before (she was pregnant at the time, and the child was still-born), she had had good health. No cardiac or renal disease was discovered, nor could any history of syphilis be elicited.

The right optic nerve was pale, its contour was ragged, and at a short distance from its upper and temporal side there were several small white spots produced by atrophy and disappearance of the choroidal pigment, and a single larger, black, hyperplastic pigment spot. The venous system in the retina of the left eye was very turgid.

CASE XXX.—*Neuro-retinitis—Rheumatic Fever.*

A man, æt. 44, was startled by a defect in his right eye, which increased and took the form of a large central scotoma, which he compared in size and shape to a frying-pan. Fourteen days after this, when he came to the Royal London Ophthalmic Hospital, he could see the ends of the short lines of test-types,

but not the beginnings, and read words in No. 18 J. with this eye; the other eye was not affected. The right optic nerve and the retina around it were of an opaque grey colour, the opacity fading peripherally. In the opaque area the artery was quite hidden, and the veins were very indistinct, while in the transparent part of the retina the turgescence of these latter vessels made them very conspicuous. Two red brushes of extravasated blood radiated from the upper and nasal side of the nerve,

This patient had had rheumatic fever seven years before, during which his heart was said to have been affected, but no lesion was discovered when he came under my observation.

CASE XXXI.—*Congestion of the Optic Nerves and Retina—Rheumatic Fever.*

A hop porter, æt. 41, whose sight had been slightly defective for about a year, came to the Royal London Ophthalmic Hospital October 10th, 1863; his V. at that time was = $\frac{1}{18}$ Snellen. The optic nerves were slightly hyperæmic.

He had had rheumatic fever four years before, which had left him, he said, short-winded, but no cardiac lesion was discovered by us. His work was very laborious, obliging him to mount three stories in a lofty warehouse several times a day. He was pale, and complained of great lassitude.

I saw him again in June, 1864. His visual acuity was less, with the right eye he could not read smaller type than No. 12 J., and with the left eye no smaller type than No. 14 J. Both optic nerves were then decidedly hyperæmic, and the retinal veins were over-full and varicose.

IV. Group of cases not referrible to the preceding groups.

CASE XXXII.—*Neuritis Optica—Masturbation and Sexual Excesses.*

A stout, very pale man, æt. 31, who had masturbated excessively, then had married, and indulged immoderately in sexual intercourse, found his health and sight fail. He put himself under the care of one of my colleagues at the Middlesex Hospital, by whose courtesy I had an opportunity of examining his eyes. With the right eye he could still count my fingers at a

few inches distance, but the right had only quantitative perception of light.

Both optic nerves and a belt of the surrounding retina, as broad as their radius were swollen; they had an opaque greyish-white colour. In this region the arteria centralis could scarcely be distinguished, and the veins were only slightly less indistinct, while in the clear retina beyond they were very turgid.

CASE XXXIII.—*Neuro-retinitis—Numerous Apoplexies in the Nerve and Retina.*

A healthy-looking woman, æt. 44, having gone to bed seeing well, awoke in the morning with dimness of the left eye. A week later she saw purple spots on some white clothes, and came in great fright to the Middlesex Hospital, 11th March, 1863. At this time she discerned, with an effort, letters in No. 18 J. with this eye, and the other eye was not affected.

The left optic nerve was of an opaque red-grey colour, and stippled with minute crimson dots of extravasated blood. Within the disc the arteries were not visible, and the veins appeared to end taperingly at the surface. In the retina, between the nerve and the equator, there were several large dull-grey blotches, in which the veins were often hidden; and here too there were many small red capillary apoplexies, and some grey dots, which were thought to be retrograding apoplexies. The vitreous humour was cloudy.

I could not find any renal or cardiac disease. She had ceased to menstruate five years before.

Leeches were put to the temple, and she took corrosive sublimate.

A week later the vitreous humour was less cloudy. The red hæmorrhagic dots were fewer, and the dull-grey dots were more numerous.

April 11th.—The contour of the optic nerve was distinct; the larger branches of the vasa centralia could be traced beneath the surface of the disc to the lamina cribrosa, and the finer twigs were also plainly discernible. Her sight was, however, rather less clear. She continued to take corrosive sublimate, and the exudation gradually disappeared, and her sight improved so that

she read, 6th May, No. 16; although at this time fresh apoplexies were seen in the retina and in the choroid, below and at the temporal side of the optic nerve. In July a slight blur of the contour of the nerve was the only remaining morbid appearance, and with a + glass, answering to her presbyopia, she read No. 14 J.

CASE XXXIV.—*Neuro-retinitis—Hæmorrhages and White Dots in the Retina—No Albumen in Urine.*

A general dealer, æt. 59, came to the Royal London Ophthalmic Hospital 27th March, 1867, having a fortnight before found his right eye defective. He could just recognize letters in No. xxx S. with it. The optic nerve and the retina immediately around it were slightly swollen and hazy. The opaque region was dappled with red apoplexies and white dots and blotches. The vena centralis was turgid.

No albumen was found in his urine. He denied having ever had syphilis. He smoked half an ounce of tobacco daily, and drank but little beer.

CASE XXXV.—*Neuro-retinitis.*

A tall, stout, ship's stewardess, æt. 56, whose sight had been imperfect during five or six years, came to the Royal London Ophthalmic Hospital for advice, 25th March, 1865. With spectacles which corrected her presbyopia she read No. 6 J. with her right eye, and No. 10 J. with the left. Both optic nerves were hyperæmic and hazy, and a hazy band stretched from the nasal side of the left into the retina. In May the nerves were less hyperæmic, but they had become swollen, and had a pale bluish-grey tint. The retinal veins were distended. She now only read No. 14 J. with the right eye, and No. 10 J. with the left.

CASE XXXVI.—*Neuro-retinitis.*

A trimming-maker, æt. 21, came to the Royal London Ophthalmic Hospital, June 27th, 1866, for advice about "a film" over her left eye, which she had first noticed a fortnight before. She read No. 4½ S. with this eye. The nasal half of its

optic nerve was too red, while the temporal half was swollen and opaque. Corresponding to this, the contour was confused, and an opaque greyish patch, equal to $1\frac{1}{2}$ diameters of the disc, ran out from it on the retina. The entire length of this was traversed by a small vein, which had so sharp an image that it was manifest that the opacity was situated behind the inner strata of the retina, and was, therefore, in the outer strata of this coat, or between it and the choroid, or in the choroid. In the retina below the disc there was a small grey spot, with a central dot of extravasated blood.

Under a course of corrosive sublimate the hyperæmia and the opacity disappeared, and her sight improved.

CASE XXXVII.—*Neuro-retinitis—Disease of the Aortic Valves.*

A pale, wasted woman, æt. 53, came to the Royal London Ophthalmic Hospital, 21st May, 1864, complaining of a gradual failure of sight, of several months' duration, interrupted by intercurrent accessions of greater dimness. These, she said, had been very frequent during the last eight or ten weeks, and, she added, "sometimes, two or three times in a quarter of an hour, I go quite blind for a couple of minutes; my sight goes gradually, but comes back quicker." With each eye she read No. 18 J. Both optic nerves and the immediately surrounding retina had an opaque reddish-grey colour, which hid the contour of the nerves, and caused apparent breaks in the vasa centralia. In the left eye the vena centralis was especially turgid.

Always delicate, in childhood she had had inflammation of the knee-joint, ending in ankylosis. Fifteen months before I saw her she began to suffer from a thumping noise in the head, chiefly in the occiput and right temple, and she not unfrequently fainted.

She had a loud systolic bellows sound—loudest at the base of the heart and along the aorta, towards the right sterno-clavicular joint. No albumen was found in her urine.

CASE XXXVIII.—*Neuro-retinitis and Circumscribed Choroiditis.*

A schoolmistress, æt. 24, was alarmed by the appearance of a large round blur directly in front of the left eye, shortly after

which this eye felt tired and strained, even by slight use. She came to the Royal London Ophthalmic Hospital January 28th, 1859. I found the lower half of the visual field of this eye mutilated. The visual acuity, diminished throughout, was greatest just above the centre of the field, and only here she could read type about equal to No. 16 J. The optic nerve and the retina around it were swollen, and so opaque that the vessels were completely hidden in the nerve and for some distance beyond its margin. One-sixteenth of a grain of corrosive sublimate was ordered to be taken three times a day. Under this treatment the swelling and opacity slowly disappeared, and on April 8th a slight blurring of the upper and nasal part of the contour of the nerve, and an atrophic white spot with hyperplasia of the choroidal pigment around it near this part of the nerve, were the only remaining traces of the past inflammation. The lower part of the visual field remained mutilated, but in the upper half her visual acuity had much improved. She now read "diamond" type.

CASE XXXIX.—*Neuro-retinitis—Hæmorrhages on the Retina and Choroid.*

A tall, thin woman, æt. 29, who had, on and off, during several years, been under medical treatment, noticed a sudden dimness of the left eye. Next day, when she came to the Middlesex Hospital, she could not read smaller print than No. 16 J. with this eye; its optic nerve and retina were slightly hazy; and the retinal veins were very swollen. There were numerous small spots of extravasated blood in the choroid, and a few larger patches in the retina.

She was evidently in very weak health, and had been confined of her second child only six weeks before. Her urine did not contain any albumen or sugar, but its sp. gr. was rather high, 1027°. She often fainted. The heart's sounds were normal.

The haziness and the hæmorrhages disappeared; and the congestion gave place to anæmia and atrophy of the optic nerve.

ON SOME OF THE ANOMALOUS EFFECTS OF ATROPINE ON THE EYE.

By GEORGE LAWSON, F.R.C.S.,

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ATROPINE is chiefly used in ophthalmic practice to procure dilatation of the pupil, and to act as a sedative in various forms of inflammation of the eye. The preparation which is generally prescribed is the sulphate of atropia, this salt being preferred to the alkaloid, on account of its greater solubility, for whereas the sulphate is readily dissolved in distilled water, atropia is soluble in water in the proportion only of 1 in 500 parts.*

In an ordinarily healthy eye, where the retina possesses its normal sensibility, and the iris acts freely, I have never known atropine fail to dilate the pupil; but as a sedative to the eye, I have, on a few occasions, seen it not only fail, but act as a direct irritant, and in two cases which I have to relate it caused the most acute and troublesome symptoms.

In speaking of the anomalous symptoms produced by atropine, I would state my belief that they are entirely exceptional, and that whilst it is well to be aware that they may possibly arise, yet I do not think they ought to prejudice the surgeon against the use of a drug which, when fitly prescribed, is, in the large majority of cases, most beneficial. That a solution of the sulphate of atropia will occasionally produce irritation has been noticed by several ophthalmic surgeons, and the reason of its acting in this irregular manner has been attributed to the presence of some free acid in the solution. The salt has

* Squire's Companion to the Pharmacopœia.

not been neutral, and the solution has given a slightly acid reaction to litmus paper, and to this has been attributed its irritating effects.

I think myself that the explanation is wrong, and that the free acid theory has but little, if anything, to do with the fact that a solution of atropine will occasionally give rise to very painful and troublesome symptoms. What amount of free acid can there be in the one or two drops which are dropped into the eye from a solution of the sulphate of the strength of gr. j. ad aquæ $\mathfrak{z}\text{j}$.? and yet when thus diluted I have seen it occasion great irritation. We use daily in ophthalmic practice salts which contain much more free acid than the sulphate of atropia, such as the sulphates of zinc and alumina, but I do not remember any instance in which they have caused the peculiar forms of irritation which, in exceptional cases, I have seen spring from atropine. I believe that when atropine acts thus as an irritant, or produces peculiar and distressing symptoms, it is due to some idiosyncrasy on the part of the patient, which renders him intolerant of the alkaloid or of its salts, and, in some cases, of any preparation whatever of belladonna. In one or two patients in whom even a very weak solution of atropine has given pain to the eye, I have found that a solution of the extract of belladonna has been borne without even a feeling of annoyance, whilst in other cases the use of belladonna in any form whatever has seemed to act almost as an irritant poison.

The anomalous symptoms which atropine may produce are—

1st. A sense of smarting and heat in the eye, accompanied by redness and lachrymation. These symptoms may pass off in a few minutes, or they may extend over some hours, or even continue for many days.

2nd. An erysipelatous condition of the eyelids and surrounding integuments, with redness and chemosis of the conjunctiva.

As an illustration of the first class of symptoms I

will cite the following case:—For a patient on whom I had ten days previously operated for cataract, I ordered a solution of atropiæ sulph., gr. j. ad aquæ ʒj., to be dropped into the eye twice daily. The drops caused so much pain and redness of the eye that she was obliged to discontinue their use. On another occasion the same patient called at my house to have the eye which had not been operated on examined with the ophthalmoscope. Thinking that the irritation which had previously followed the use of the atropine might have been only an accidental occurrence, and due really to other causes, I dropped again into the eye some of the atropine drops. A little smarting was the immediate result, but the pupil became dilated, and I was able to examine the eye. By the time, however, she had reached home, the pain had much increased, and the eye shortly became acutely inflamed, and continued so for some days. This patient, I afterwards found, was able to use a solution of gr. v. of the extract of belladonna to the ounce of water without the slightest annoyance.

I have frequently seen atropine produce a momentary sense of pain at the time of its being dropped into the eye, accompanied with a flushing up of the conjunctival vessels, but, as a rule, these symptoms have lasted but a short time.

The next case is an example of the second group of symptoms which may be caused by atropine. At the beginning of this year I operated on a gentleman for cataract. The case at first progressed very well; but as there was a little soft lenticular matter in the pupil, I ordered a solution of sulphate of atropia (gr. j. ad aquæ ʒj.), to be dropped into the eye twice a day. Soon after its application the eye became very painful, with the lids swollen, and on the following day there was a distinct erysipelatous blush over the lids, and extending down the face. As I had never seen erysipelas follow the extraction of an opaque lens, or the use of atropine to the eye, I

regarded its occurrence as an accidental circumstance; but as the drops gave pain, they were stopped, and a lotion of the extract of belladonna was substituted. The erysipelas, however, increased, spreading over the head and forehead, and down the face. The belladonna lotion was shortly afterwards discontinued, as with the swelling of the lids it was not only useless, but it seemed to give pain. All the severe symptoms now abated, and the patient soon recovered, but with the pupil closed by opaque capsule. About six months afterwards the gentleman called on me at my house, as I wished to examine the eye previous to performing a needle operation. In order to ascertain how much the pupil would dilate, I dropped into the eye two drops of a solution of atropiæ sulph., gr. ii, ad aquæ ℥j. I had not at that time connected the erysipelas with the use of the belladonna, and was quite unprepared for the symptoms which were to follow. Very shortly after I had put the atropine into his eye, he complained of pain, which steadily increased; and about four hours afterwards the lids began to swell, and a distinct erysipelatous blush showed itself. By the following morning he was unable to open the lids on account of their swollen state, and there was a diffuse form of erysipelas extending from the lids to over the brow and face. As there was now no further application of any form of belladonna, the symptoms, having reached a certain height, gradually subsided, and the patient in about a week recovered. In this patient the relationship between the cause and effect was so manifest that there could be no doubt that the erysipelas was solely due to the atropine. Not only was he unable to bear the use of atropia, but a solution of the extract of belladonna evidently kept up the irritation in his first attack of erysipelas.

SYMPATHETIC OPHTHALMIA CAUSED BY A PROPAGATION
OF THE IRRITATION EXCITED BY IMPROPERLY WEARING
AN ARTIFICIAL EYE ON A PARTIALLY SHRUNKEN GLOBE.

By GEO. LAWSON, F.R.C.S.,

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the Middlesex Hospital.*

THE following case is an example of the danger which is incurred by wearing an artificial eye on a shrunken globe, unfitted to support it. In this patient the sound eye suffered from sympathetic ophthalmia, caused by the irritation induced by wearing an artificial eye over a partially shrunken globe on which there still remained some of the true corneal tissue. The right eye had been completely lost for five and a half years, during which time it had given no annoyance, yet three weeks after wearing an artificial eye the stump became inflamed and painful. For nearly three months the man suffered from recurrences of this inflammation, until at last the sound eye sympathized, and rapid impairment of sight followed. Fortunately such cases are not very frequent, but still when they do occur they serve as warnings which should not be lost sight of. It is now an established fact that when transparent or semi-transparent cornea exists on the stump of a lost eye, an artificial one cannot with safety be worn. The false eye becomes a source of danger which may, as in the case I have to relate, be productive of irreparable damage to the sound eye. The true corneal tissue will not bear the friction against it which is engendered by an artificial eye, and when, as occasionally happens, a shrunken globe with true cornea still remaining on its surface, bears an artificial eye with impunity, the explanation is, that the artificial eye has been so constructed

that it does not press on the corneal surface, or exert any friction against it. The irritation which the false eye may excite may be confined to the shrunken globe, but on the other hand, there is always considerable danger that, as in the following case, the sound eye may become affected, and ultimately involved in that formidable disease so well known as sympathetic ophthalmia.

George B., æt. 29, came under my care at the Ophthalmic Hospital on June 18th, 1867. The history he gave of his case was as follows:—His right eye was lost from acute ophthalmitis five and a half years previously, when a portion of the cornea suppurated, and all sight was destroyed. The eye then gradually collapsed about one-third, and became soft.

Three months and a half before applying to the hospital he had an artificial eye fitted on to the remains of the lost one, and he began to wear it daily. The sight of his left eye was then very good. After wearing the artificial eye for about three weeks, he was obliged to discontinue it, on account of the pain and inflammation it excited in the shrunken globe. Similar attacks of inflammation recurred frequently, but they were always relieved by laying aside for a time the false eye. During one of these recurrences, about a fortnight previous to his application at the hospital, the left eye became affected sympathetically. The sight soon became very dim, and being compelled to leave his work, he came up to the hospital with the hope of gaining relief.

State on Admission.—*The lost eye* was shrunk about one-third. The greater part of the cornea was occupied by cicatrix tissue, but there was still some true cornea remaining. The globe was very red and painful. Its tension much diminished — T 2.

The left eye was suffering from sympathetic ophthalmia. The eye was red and watering. The aqueous humour was serous, so that the iris had a greenish hue, and there were some adhesions between it and the capsule of the lens. There was also some lymph on the lens capsule within the pupillary space. The tension of the eye was increased to T 1. He could only read words of 20 Jaeger.

June 18th.—The man was admitted into the hospital, and I removed the shrunken globe. He recovered quickly from the

operation, and was, in a few days, made an out-patient. The left eye has since very decidedly improved. There have been two or three recurrences of the inflammation since he left the hospital, but the eye is gradually subsiding into a quiet state. When I saw the patient in November last, the cornea was bright and clear; the sclerotic had nearly regained its normal whiteness; he was quite free from pain: and there was some improvement in his sight. He could read 20 Jaeger easily.

DISEASE OF THE CORNEÆ IN A CASE OF EXTENSIVE
CUTANEOUS ANÆSTHESIA (ELEPHANTIASIS GRÆCORUM
ANÆSTHETICUM ?)

By Dr. CHISHOLM (of Charleston, U.S.).

A. J. ROSE, æt. 44, a carpenter by trade, of apparently good constitution, from healthy parents. His mother died in advanced age, from phthisis; his father from some acute disease, at 60 years of age. No case of phthisis has since occurred in his family. He married at 22 years of age, in 1844, and has had three children. The first was an unusually large child at birth, and continued to develop rapidly. At 16 years of age, when he entered the Confederate army, he weighed 235 lbs., with a manly appearance. The second, a healthy child at birth, died suddenly when three days old. The third was born after the commencement of his disease, and came into the world sickly. It lived 18 days, and an autopsy revealed disease of the heart.

When 26 years of age, in May, 1848, he strained himself in lifting a heavy piece of timber, and from that time and to that accident he attributes the commencement of his disease. Soon after receiving the injury, a gradual and painless contraction of the fingers and toes took place, accompanied by an equally gradual loss of sensation, which progressed to a permanent and more or less complete anæsthesia. No inflammatory symptoms existed with these contractions. In two months the toes and fingers were so drawn, that he was forced to give up temporarily his trade. The contracted toes did not materially interfere with locomotion, but the contracted fingers prevented him from using his tools, and made him utterly helpless. A slight improvement in his symptoms enabled him, four months from the accident, to resume his work. Relaxation of the members was never however complete. About this period a large blister formed spontaneously over the metacarpo-phalangeal joint of the left big toe. The bursting of the bleb, and the accidental removal of the detached cuticle, established an ulcer, which, after repeatedly healing and re-opening, has, for the past eight years, remained a permanent sore.

In 1851, three years from the commencement of the disease,

a dark spot, like a blood-blister or a bruised surface, made its appearance at the extremity of the left index finger, unaccompanied by pain or swelling. In time the tissue broke down into a small ulcer, through which the head of the necrosed phalangeal bone protruded, and was eventually exfoliated.

In 1853 the extremity of the fourth finger of the left hand took on the same action. The bone remained protruding for nearly six months, without pain or swelling, when it was removed by a surgeon. The end of each third phalangeal bone in turn protruded through a similar painless chronic ulcer, and was in time discharged, a healthy cicatrix rapidly forming in each instance. Unless these necrosed bones were cut out before nature had isolated them, the exfoliation would be accompanied by neither redness, pain, nor swelling. A profuse ichorous discharge was the only accompanying phenomenon. Progressively each finger and toe lost its third phalangeal bone, then its second, and in most instances the first. Only two of these bones now remain in the hand, all of the others having been thrown off. In the feet necrosis of the metatarsal bones is now going on. These exfoliations from the fingers he characterises as altogether different from whitlows, a disease from which he had severely suffered in early life. He could foretell, he states, the loss of a phalangeal bone by a sensation of looseness of the bone within its soft envelopes, and its approach to the surface before the bloody, blistered spot would appear, which was invariably a precursor of ulceration and exfoliation.

Four years ago, a red spot appeared upon the lower edge of the lower cornea, and gradually developed itself into a fleshy, vascular, thick mass, which slowly extended upwards, involving the entire thickness, and finally the entire extent of the cornea. This change in the parenchymatous corneal tissue slowly crept upwards over the pupil, and at the end of three years had involved the entire extent of cornea, so as to completely shut out light. In its origin and progress it had caused no pain. The conjunctiva was slightly congested, with an increase in the lachrymal secretion. One year ago a similar spot appeared upon the lower border of the right cornea at its junction with the sclerotic, and, like that in the left eye, has gradually progressed upwards, rendering in its progress the corneal tissue thick, vascular, and opaque.

His condition at present, May, 1867, 19 years from the commencement of the disease, is as follows :—His general health is good. He eats, digests, and sleeps well. His spirits were good, until the progressive disease of the eyes threatened to leave him in darkness. His height is 5 ft. 8 in., and weight 146 lbs. The skin of his face, body, and limbs, is apparently very healthy, perfectly soft, without thickening or discoloration. In warm weather he perspires excessively. Anæsthesia more or less complete, exists over all portions of the body, and has been a prominent symptom from the commencement of the disease. When struck with a sharp instrument, he experiences only a sensation of pressure, not of pain. The only portions of the body where he feels the prick as such, are over the upper portions of the spine, the back of the head, and the skin of the chest, from under the arm-pits to the waist.

The elimination of the various phalangeal bones was painless, and without inflammatory symptoms, unless nature was interfered with. The cutting away of the dead bone would be followed by a soreness and a swelling of the finger, and a pain in the arm-pit without swelling. He at times has a severe pain in the soles of the feet, which he likens to boring with a sharp awl, yet there is no sensation when struck. In washing his feet his wife usually tests the temperature of the water. Some years since, during her absence, he undertook to do his own testing, and was only aware that he had used boiling water to his feet, when he saw most of the skin of his extremities come away in the towel. In spite of this extreme anæsthesia, should he unexpectedly tread upon a pebble, a very severe pain darts up the limb, disappearing immediately upon the removal of the cause. His hands and arms are equally insensible to pain. On one occasion he thoughtlessly leaned against a hot cylinder, and baked his arm, painlessly. His attention was not called to the accident until the next day; an extensive cicatrix marks the seat of the injury.

Notwithstanding the loss of sensibility, his flesh heals very rapidly, when cut or bruised. In spite of the many ulcers which from time to time have given exit to necrosed bones, the skin is soft and healthy on his boneless fingers, which, with good nails appended, are drawn up towards the palm. The extremities of his feet are in an ulcerated condition, and discharging an offensive

ichor. With loss of sensibility there has been no loss of muscular force, or any indication of paralysis. His limbs are large, firm, and well developed. His mucous surfaces are not affected, sensation in them is natural. He controls urination and defecation, and complains of the usual colic and griping pains of indigestible food or drastic medicines. His hearing is perfect, and taste good. His sense of smell has only become impaired within the past year, since which time large brown crusts have been discharged from the nares weekly. There is no excessive or offensive discharge from the nose, and he can still detect odours. His sight is nearly gone, the eyes presenting a curious appearance. The left cornea is replaced by a thick, fleshy, red disc, apparently of fibrous structure, with abrupt perpendicular margins at the sclerotico-corneal junction. At this circular line the diseased corneal tissue is suddenly elevated three-eighths of an inch, into a thick, flat disc, covered by a comparatively healthy and not much thickened conjunctiva. In this transparent mucous tissue, a few large vessels run to the slightly depressed centre of the disc, and then disappear in its substance. The ocular conjunctiva is only slightly injected, and otherwise healthy. The sclerotic and other tissues of this eye are apparently in a healthy state. Neither pain nor inflammatory symptom accompanied this corneal change. Since sight has been shut in, the eye has had a sore feeling, and exposure to strong light is uncomfortable. The lachrymal secretion is in excess.

In the right eye the process for the corneal change can be readily followed. The lower half of the cornea has already undergone the conversion into thick, opaque, pinkish, fibro-cellular tissue. The margin at the sclerotic-juncture, the portion first changed, is abruptly elevated one-fifth of an inch. This thickened portion is continuous for the extent of two lines. The opaque, fleshy, cornea is then gradually bevelled off towards the neighbourhood of the pupil, when it fades out into a cloudy cornea, which parenchymatous cloudiness precedes the conversion into thickened, fleshy, fibro-cellular, not very vascular tissue. The upper third of the cornea is perfectly transparent, and apparently healthy, the middle third is cloudy above, and opaque below; the lower third is thickened, opaque, and conspicuously and abruptly elevated. When the eye is directed downwards, the anterior chamber appears of normal dimensions, and not

encroached upon by the thickening cornea, the increase in which appears to be altogether external. The iris is healthy, as are all other tissues of the eye. The pupil acts freely, and under atropine, which allows the pupil to correspond with the upper clear third of the cornea, he sees well. There is a slight redness of the conjunctiva, and increased lachrymation.

The patient's habits have been always good. Has not had syphilis. Wife healthy. No miscarriages. Has never had cutaneous eruption, nor sore throat. Has been under treatment from the commencement of his disease, dating from the strain. Has been kept for months under the influence of mercury. Has taken pounds of iodide of potassium, and gallons of cod-liver oil, and ounces of Donovan's arsenical solution. Has exhausted the list of alteratives, yet the disease steadily progresses.

A CASE OF EPILEPTIFORM AMAUROSIS.

By J. HUGHLINGS JACKSON, M.D.,

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Assistant Physician to the London Hospital.*

SOME time ago I spoke of cases of patients who had occasional temporary disturbances of vision, using the term Epilepsy of the Retinæ. I then thought the retina was the part of the nervous system in fault, but a further study of cases of brain disease makes me feel far less certain of this in any case. I now therefore use the term Epileptiform Amaurosis, but simply because it implies less. Were I sure that the retinæ were the seats of the temporary change, I should still use the expression Epilepsy of the Retinæ. For I think, to say the least, that as standing for a clinical entity Epilepsy is a term of doubtful value, and it would serve very well as a name for the occasional discharge of nerve force which deteriorated nerve tissue allows. I trust we shall ultimately be able to apply the term precisely to temporary states of various internal regions at fault, when there are certain temporary external symptoms. To show how I hope to use it, I will mention that I conceive unilateral convulsion to be Corpus Striatum Epilepsy, the analogue of the common form of Hemiplegia Corpus Striatum Paralysis. Again I consider Case XXIV, recorded in my last paper, to have been an Epilepsy of parts in the range of the anterior cerebral artery.

I wish to consider Epileptiform Amaurosis in comparison and contrast with temporary disorder of another important Special Sense, viz., with subjective sensations of smell. (See Cases XXI and XXIV.)

In most cases I have seen, when the patient has complained much of such sensations he has, besides the occasional losses of consciousness, complained also of great

mental failure. This is the more strange as my practice does not include cases of what are usually called mental disease. It is, however, an association of symptoms which theoretical considerations of the community of blood supply of the olfactory bulb, and a large quantity of the hemisphere would lead us to expect to occur. (See p. 281, "Lancet," June 16th, 1866, "Med. Times and Gazette," Feb. 29th, 1868.)

Next, I have remarked several times that in cases of convulsion beginning unilaterally, temporary failure of sight is sometimes a complication, and I have pointed out that this temporary association of symptoms has its permanent counterpart in amaurosis, from double optic neuritis, and hemiplegia. I have spoken of a possible explanation of the connexion of the two symptoms ("Med. Times and Gazette," April 30th, 1864, and these Reports, Vol. V., Pt. IV.) by a consideration of the arterial supply to the optic nerves, corpus striatum, and hemisphere; on the same principle, as I explain the association of occasional loss of consciousness with subjective sensations of smell. With Amaurosis and Unilateral convulsive seizures, there are usually no mental defects, beyond delirium in Cerebral Fever. The middle cerebral artery commands fewer convolutions than the anterior cerebral artery, which vessel supplies the great commissure, the corpus callosum, betwixt the cerebral hemispheres. When the convulsion is of the right side, however, there may be temporary defect of speech.

Having instanced Epilepsies in which smell and sight are involved, I will just mention that there are temporary seizures which have intelligent relations with deafness and subjective noises, presumably of nervous origin. In these cases there are interparoxysmal circulatory symptoms, "nervousness;" the seizure may be a "faintness," or a convulsion, and is sometimes attended with great sickness. In this instance, however, the hypothesis of arterial regions does not apply. The relations of the auditory to the vagus

nucleus account, I suppose, for such an association of symptoms.

My impression is, that by studying the permanent along with the temporary defects of the three important special senses in their most intelligent relations with other symptoms, we may be able to learn much of the real pattern of the nervous system.

In some cases the failure of sight is by coloured vision, and I have recorded cases of convulsion, beginning unilaterally in which there was this manner of failure. I now record a case in which the sight simply failed occasionally. In this case the failure of sight is not so easily explicable as it is when it occurs with unilateral convulsion. We cannot form any speculation as to the part of the optic nervous system which failed. The Epileptiform Amaurosis was probably a partial fit—an aura—just as spasm of the hand is a partial fit of convulsion, occasionally merging in a severe and general convulsion. Some patients who have convulsive seizures always lose their sight before the fit. The following case is interesting because the failure of sight occurred in the place, so to speak, of seizures which most would admit to be “epileptic,” or “epileptiform.”

A man, 23 years of age, consulted me for seizures of several kinds.

Six years ago he suddenly lost consciousness in a theatre; was told he struggled. Except that next day he was sore, he could tell me no more of this fit.

Three years ago, when standing in his office, he suddenly fell down insensible, but quickly recovered after water had been thrown on his face, without a struggle. He had a second similar attack in a fortnight.

About three months later, he found one morning that his tongue was bitten, and again a few months later still. No doubt on each of these occasions he had had a convulsion in the night.

About two years ago, he had attacks of loss of sight. He

had four or five altogether, over a period of twelve months. He was a very intelligent man and he described clearly what he experienced. He said that things would grow *gradually* more and more indistinct until he could scarcely see anything. It would seem to reach a point, and then return again. It was like a film; no sparks, flashes, or colours. It would come on when he was quite still at his desk, and had come on when walking. He had no giddiness accompanying the sensation, but headache for an hour, or for several hours, followed it. There was no trace of loss of consciousness. In reply to a leading question, he said he felt sick when the attack was on, but he had never vomited. It was difficult to get to know how long the failure lasted. He thought about a minute. (The discs are quite normal.)

Now for the last year he has had seizures of another sort. "Feelings," *i.e.*, he explains, a "half stupor" and "half recollection of a dream coming over him." He is told that he turns pale; he never falls; they last about a minute. He "seems to get into a perspiration," and feels hot. As it leaves him it gives him a twinge in his bowels, as if he must go to the closet immediately.

In the following case, in spite of the circumstantiality of the account first given, it was quite clear, on further investigation, that the so-called losses of sight were attacks of *petit-mal*. It is recorded in order to show a kind of case I do not include under the term Epileptiform Amaurosis. The first paragraph contains the account first received.

A single woman, 17 years of age, supposed to have good general health, consulted me for fits. She was subject also to *sudden* losses of sight. She would all at once pass into complete darkness. Her mother remarked, that if she passed her hand before her daughter's eyes there was no blinking. The fits the girl had were always preceded by the loss of sight, but the loss of sight was not always followed by the fit. In the fit the head turned to the left, and it was said she "worked" on that side of the body.

This case loses the peculiar significance the above report implies, when it is added that the girl at the time

when her "sight failed," turned of a "blue-black;" that she dropped anything she had in her hands, although she did not fall, and that during the attack she spoke strangely and also indistinctly. There is no evidence that in these attacks the optic nervous system was particularly implicated. The patient lost herself altogether, rather than her sight only.

Dr. Homberger has published a very interesting paper on this subject. I should refer also to Mr. Zachariah Laurence's paper on Functional Affections of the Retinæ, in the British Medical Journal.

CLINICAL NOTES ON PYRAMIDAL CATARACTS, WITH
SPECULATIONS AS TO THEIR CAUSE.

By JONATHAN HUTCHINSON, F.R.C.S.

UNDER the terms "central cataract" and "pyramidal cataract," ophthalmic surgeons have, from early times, recognized the occurrence of little isolated opacities on the front of the lens. As these are almost always more or less elevated, and as the term "central" is liable to be confused with "nuclear," we may perhaps conveniently employ only the term "pyramidal." In rare cases the pyramidal form is very definite, and a little hillock of opacity, a line or two in height, projects forwards into the pupil. Viewed by oblique illumination these opacities are very beautiful objects, presenting sharp edges, and reminding one of a miniature iceberg. All observers seem to agree in the following statements respecting them:—

That they are usually found in both eyes, and are exactly symmetrical.

That they are easily picked off by the needle.

That in many cases, if not in most, they are not attended by opacity of the lens substance at other parts, and that the patient may go through life without any special tendency to complete cataract.

That in a certain number of cases, however, an opacity is met with also at the posterior pole of the lens, and that in others there are striæ of opacity through the whole of that structure.

The fact that they are very frequently met with in those who have suffered from purulent ophthalmia in infancy has attracted the attention of all, and has even led to the suggestion that they are due to the occurrence of central perforation of the cornea and consequent deposit of lymph on the most prominent part of the lens.

It is to the theory of the cause of these opacities that I now wish to ask attention. The evidence in support of the popular belief that they are in some way due to purulent ophthalmia appears to be very strong indeed. I have recently met with a number of facts tending to support it, of a kind not as yet, I think, adverted to, and much stronger than those which merely concern the occurrence of the one with the history of the other. I allude first to cases in which the cornea shows still persisting evidence of damage, and, secondly and chiefly, to cases in which but one cornea shows evidence of former ulceration, and the pyramidal cataract is found in but one eye. These non-symmetrical cases seem to me to give very valuable evidence. During the last few years I have collected the particulars of about six or eight cases, in which the patient gave the history of ophthalmia in infancy, had an opacity of greater or less extent on one cornea only, and had a pyramidal cataract on one lens only. In all these cases the corneal opacity and the cataract were in the same eye. In addition to these, I have seen two or three others of pyramidal cataract on one side only, in which no corneal opacity was present in either eye, but I have never met with any exception to the statement that if corneal opacity and cataract occur in the same patient they are found in the same eye.

With regard to the fact that in almost all the cases in which patients exhibit pyramidal opacities they give us the history of infantile ophthalmia, it is one, I believe, which all surgeons will bear out. In support of it I may just state that in several cases I have treated the patient for the attack of ophthalmia and afterwards found that an opacity on the lens was present. In most instances we are obliged to be content with second-hand testimony as to the ophthalmia.

Holding then that it is exceedingly probable that purulent ophthalmia in infancy does in some way or other influence the formation of these curious opacities, we come

next to the question as to how it is done. The facts on this head seem to be these. In the great majority of cases of pyramidal cataract there is not the slightest evidence of damage to the cornea, and not the least reason to suspect that a perforation has ever existed. In those in which there is a corneal opacity still, as a rule, there is no synechia nor any evidence of actual perforation. Now and then in the rarest cases a single slender film is found passing from the cornea to the lens, but these are most exceptional. It is impossible, when we find the cornea brilliantly clear in every part, to believe that perforation has ever taken place, for we have no facts by which to credit such an hypothesis. Then, again, we must bear in mind the fact that all who have examined these opacities agree in stating that they consist not of lymph on the surface of the lens-capsule, but of deposit in the epithelial layer beneath the capsule.

The theory which I would venture to support is this: that the mere proximity of the inflammatory action on the surface of the conjunctiva and cornea suffices to disturb the nutrition of the lens capsule, and to produce deposits. It is, of course, admitted that the lens surface is, during infancy, in very close proximity with the posterior surface of the cornea, so that such disturbance of nutrition may be more easily possible than it would in adult life. Still, if this hypothesis be tenable, we have, in the occurrence, a most interesting example of the pathological possibility that diseased action may, by a sort of vital catalysis, disturb a structure with which it is not in continuity, and when there exists between the disturbing and disturbed tissues a structure (cornea) which is wholly unaffected, and a layer of fluid of greater or less depth.

As regards the structure of these little pyramids there can, of course, be no doubt that they are produced by overgrowth (fibroid) of the sub-capsular epithelium, and the chief marvel is that they should usually be so remarkably limited in extent. An excellent paper by Mr. Hulke,

recording researches on this epithelium, will be found in a former volume of this Journal. (Vol. i, p. 188.) Mr. Hulke writes of cataracta pyramidata, "In ophthalmia neonatorum, when the cornea has become inflamed and swollen, its posterior surface may actually come into contact with the front of the lens, and then a dot of lymph poured out upon the latter by the inflamed cornea, or even the mere pressure contact, may give rise to opacity by preventing the proper nutritional osmose through the capsule." The prominence of the lens in the infant's eye, to which also Mr. Hulke draws attention, is undoubtedly a very important fact, but inasmuch as the deposit is always beneath the capsule, it is not easy to accept the suggestion that it results from a dot of lymph from the posterior surface of the cornea. The fact, first noticed, I think, by Mackenzie, that a little corresponding opaque dot is sometimes (very rarely) seen on the posterior surface of the cornea, further helps us in associating the cataract with the ophthalmia, though it scarcely goes so far as to support the theory of perforation, as supposed by some authors. Against the idea that perforation is an essential stage, we have numerous facts:—

1st. The perfect transparency of the cornea in almost all cases.

2nd. The great rarity of iritic adhesions.

3rd. The circumstance that the opacity is sub-capsular.

Mr. Hulke states that he agrees with those authors who consider that these opacities do not project outwards, but that they are really "embedded in the substance of the lens." He even asserts that the base of the cone is towards the capsule. Fully admitting that they are sub-capsular, I cannot but think that the imbedding is a condition only occasionally present. I have examined several unusually large and beautiful cones by means of oblique illumination, and can feel no doubt that their points stood forwards and projected considerably above the level of the lens-surface.

I cannot but suspect that we adopt hypotheses which are too mechanical, when we attribute these little opacities either to corneal perforation or to prevention by pressure of nutritional osmose. As regards the latter, we must remember that there is excess, not deficiency, of growth. The production of cataracta pyramidata probably illustrates the power which inflamed surfaces have of influencing the nutrition of (and inducing cell growth in) parts which are in proximity with them, but not actually in structural continuity. We may perhaps, without absurdity, count the increased temperature, to which the front of the eye is exposed, often for several weeks, during a period of active developmental change, as a factor of some importance.

The three following cases illustrate the occurrence of these opacities in one eye only, and with evidence of ulceration.

CASE I.—Pyramidal Cataract in one Eye, with Opacity on the Cornea, and Convergent Squint and Oscillations of Globe.—History of Inflammation of the Eyes in Infancy. Hypermetropia.

Charles Rooke, æt. 22, became an out-patient on the 5th July, 1868. He stated that he had had "bad eyes" in infancy. Both were inflamed, but the right more so than the left.

Both his eyeballs were now continually oscillating, and his right squinted inwards. He could only make out the letters of 200 (Snellen) at 5 ft. with his right eye. With his left he made out 70 at 20 ft. He was slightly improved by convex glasses.

Ophthalmoscopic examination: The globes oscillated so much, that the inspection of the fundus was difficult.

The left eye. The media were quite clear, the choroid was somewhat pale, but there were no patches in it; the vessels of the retina were small, and the optic disc was of a pale, greyish tint, its margins being very obscure, as if from partially recovered neuritis.

The right eye. There was a large dense opacity in the centre of the cornea, to which the inner part of the iris adhered. The rest of the iris was quite free, and the pupil dilated well. No

bands could be detected passing from the opacity to the lens. On or in the anterior part of the lens there were two opacities, at a very short distance from each other. One was the ordinary circumscribed white patch in the capsule, exactly in the centre, and about half as large as a pin's head; the other was a similar patch, but about twice the size, less dense, and less abruptly defined, and placed perhaps half a line behind the first in the cortical substance of the lens. Some very delicate striæ could be seen connecting these two. The rest of the lens was clear, with the exception of a few small striæ passing inwards from the deeper opacity, about a third of the distance to the circumference of the lens. The vitreous in this eye was clear, and the condition of the optic disc was very similar to that of the left eye.

CASE II.—*Pyramidal Cataract in the one only; Small Opacity in the Cornea, with a single tag of Iritic adhesion.*

A boy, æt. 10, was admitted on February 14, with the following condition in his right eye: There was a pyramidal cataract on the centre of his lens, a small opacity in the middle of the cornea, and a very small tag of adhesion, extending from the iris to the opacity. The history given was the usual one, that he had had purulent ophthalmia in infancy. It had affected both eyes, but the right more severely than the left. The existence of the synechia anterior makes it certain that perforation occurred. There was no cataract in the other eye.

CASE III.—*Pyramidal Cataract in one Eye only, with Opacity of Cornea, &c.; History of Ophthalmia in the same Eye in Infancy.*

A boy, æt. 4, was brought to me on account of rather extensive but superficial opacity of the right cornea. He had convergent strabismus of the same eye. On examination, I found also a minute pyramidal cataract on the centre of the lens. The other eye showed no defect of any kind. The history was that at the age of four, he had caught cold in the right eye, and had suffered from a long attack of inflammation. The other eye was not affected.

NOTES OF MISCELLANEOUS CASES,

By JONATHAN HUTCHINSON, F.R.C.S.

(Continued from page 48.)

No. XXIX.—*Paralysis of Radiating Fibres of the Iris and of the Ciliary Muscle without apparent cause and without other complication.*

At page 137 of our preceding volume I have recorded a case in which complete paralysis of the radiating fibres of the iris occurred without complication and without any known cause. Thus we had a pupil of medium size and quite motionless. In that case failure of the function of accommodation gradually supervened and became complete. Only one eye was affected, and the man is, I believe, at the present time (15 months from the beginning of his disease) in good health, but with his iris and ciliary muscle of the affected eye quite paralysed. There has been no failure of any other muscle in the orbit. During the last few months two similar cases have come under my notice, and one of these I now record—

Mr. E——, a very healthy looking, married gentleman, aged about 35, and who had never suffered from syphilis, came under my care, April 2, 1867. He complained that he could not see clearly with the left eye, and that he had lately had shooting pain in it and around it; the pain had not been severe. The eye was not in the least congested, and presented no unusual appearance excepting that the pupil was a little larger than the other. The sight was good, and I found on covering both eyes that the right pupil dilated whilst the left remained at its original size; the left was absolutely motionless as regards accommodation. I found that his distant vision was good, though he complained that objects looked a little hazy. He could read Snellen No. 4 at 4' but not nearer, with + 15 he read No. 1 easily at 12".

The right eye was perfect and its pupil acted well.

We now proceeded to examine as to the cause of this paralysis of the left vaso-motor nerve. I could make out

nothing definite, Mr. E. was in good health, living in the country, and coming up to his office every day; all his functions seemed perfect, pulse quiet, 80. He said that he had not had any anxiety or over-work, but remarked that he was peculiarly susceptible as regards changes in the weather, and liable to sciatica and other forms of neuralgia. There was no tumour in the neck, nor any indication of aneurism.

Mr. E. had not recently suffered from tooth-ache, but he had experienced several severe attacks of sciatica, for the last of which after much unavailing drug treatment he had been obliged to resort to hydropathy, by which he had been nearly cured. As regards the inconvenience which this state of things had induced, it concerned chiefly the circumorbital pain and the dimness of sight. There had been no diplopia, and all the movements of the eye were executed well. Mr. E. could, with both eyes open, read well, but he complained that he soon got fatigued and that the two eyes seemed to bother each other. Although he focussed the type only with the right, yet he said that he could read more easily with both open than with the left covered.

In certain features a very close correspondence will be found between this case and the one which I recorded a year ago. In neither could any special cause for the paralysis be discovered, both patients were healthy adult men, and both engaged in office occupations. In each case the first symptom was immobility of the pupil. In the first paralysis of accommodation gradually followed and advanced to completeness, whilst in the second the same course is in progress, the loss of accommodation being as yet incomplete.

To judge by the want of success with treatment in the first case the prognosis is not hopeful. The worst result to be feared is, however, a complete paralysis of the ciliary muscle, and of the dilating power of the iris.

No. XXX.—*Blindness from White Atrophy (Tobacco smoking).*

Curious symptom of profuse Ptyalism, probably of cerebral origin.

Patrick Bowlse, aged 50, an Irish carman, now living at Selby, Yorkshire, came to me on account of total blindness. I examined his eyes with the ophthalmoscope by direct sunlight, and

he did not even perceive the light. His right eye had failed first. "It was in the reading I first noticed it; I never had a pain or an ache in it." The other did not fail till some months afterwards. He complained very much of a constant flow of water in his mouth, it used, he said, "to run out over his lips, and in the night it ran down my throat. I was never thirsty. I was very sleepy. I could sleep all my time out."

He was also giddy. Sleepiness, profuse discharge of saliva, and giddiness are the three symptoms which he mentioned to me over and over again. When I saw him on September 20th, 1864, he had been quite blind about three months.

The right pupil was twice the size of the other, and very sluggish; the left was of normal size. He was a married man and had a grown up family. He was a short-set, robust-looking man, but rather pale. He told me that he had smoked for 20 years 3 ounces of tobacco a week, and sometimes more.

On examination with the ophthalmoscope I found both optic discs quite white. They were abruptly round and a little depressed by atrophy but not much. There was not a trace of the pink colouring natural to the disc. The arteria centralis, however, was of moderate size, perhaps two thirds of what is normal, and the vein also was quite up to the natural size.

The rest of the fundus shewed no change.

The man could walk well, and said that he felt in good general health; he still complained much of the flow of saliva in his mouth.

In entertaining the suspicion that this man's amaurosis is due to the influence of tobacco, we must ask attention to the fact that it is very difficult to suggest any other cause. Excepting certain other equally obscure symptoms all referable to central disease of the brain, or to disease of the nutritional nerves, he has had no failure of health; drowsiness, giddiness, ptyalism, and amaurosis, the last permanent, the former passing off as this became complete, such is the curious combination of phenomena. These, too, occur in a steady, temperate, married man, a little beyond middle age. He is not a man of developed intellect, and has not over-worked either his eyes or his mind, nor has he been subject to mental anxiety. A fact which may perhaps explain why the tobacco, which he has used so freely for so many years, has only poisoned him after such a long interval of immunity must be

mentioned. During the greater part of his life he has been an Irish car driver, leading an active life in the open air, and probably counteracting the influence of tobacco by a free allowance of whisky. Three years ago his children, who have come over to England, persuaded him to follow, and practically he retired from work. He kept up his smoking and probably having nothing to do he increased it, and this whilst he was staying most of the day in the house and drinking less than formerly.

With regard to the pytalism I enquired carefully as to whether he had been taking mercury, and found that he had not. It was probably due to an irritable condition of the nerves supplying the salivary glands, and is a symptom similar in nature to excessive perspiration, irregular appetite, sickness, &c., when they occur in connection with nerve disturbance. I should add that the man had never had an injury to the head. The entire absence of headache and pain, and also of paralysis, makes it very improbable that he is the subject of a cerebral tumour.*

No. XXXI.—*Twins born Blind—Examination of the Eyes of one of them—But slight evidence of Disease of the Optic Discs.*

James Field, now aged 9, was one of twins. When they were three months old their mother discovered that they were both quite blind. They never even noticed the light. Before this as their eyes were quite bright she had not suspected anything. Until weaned they were healthy babies, but after that both remained weak and puny. One died at the age of three years, having never been able to walk. The other began to thrive when his brother died, and has ever since had good health; neither of them appear to have had symptoms of syphilis. Their mother had borne four children before the twins, and has had one since, all of whom are living and all have perfect sight. She is not aware that any of her relations or of her husband's relations have been blind. Nothing special occurred during her pregnancy, excepting that when about four months gone she one day suddenly met a friend who had been some time in Australia, and who whilst there had become blind; she was much pained at seeing him.

* Since this case was written out, I have had another example of profuse spontaneous pytalism in connection with white atrophy of the optic nerves.

The twins were, in infancy, exactly alike, so much so that they had to be marked in order to know them.

State of the Eyes.—The globes roll much and this symptom was noticed in infancy. The pupils are of normal size, but dilate widely with atropine.

In both eyes the media are quite clear; the disc in each is a little pale, and its structure slightly hazy, as if from former neuritis, but these changes are not to any great extent. The central artery and vein can be easily seen in both, but the arterial twigs are diminished in size. The margins of the discs are not so definite as usual. The choroids appear normal. The examination was made under difficulties, as he could not steady the eyes. The right disc is paler than the left, but neither of them are advanced in atrophy. The boy is well developed, intelligent, and has good use of all faculties excepting that of sight.

No. XXXII.—*Double Pan-ophthalmitis in a young Child—Varicella suspected—Destruction of both Eyes.*

I first saw Mr. Cuthbert's child on Saturday November 22nd. Mr. Simpson, with whom I attended, told me that he had been first called in two or three days previously, and had found it as he thought suffering from cerebral irritation. He lanced the gums. The day before my visit, it was noticed that the child kept its eyes shut, and that the lids were a little swollen.

At the time of my visit the lids were much swelled; and I had to use a speculum to secure a good inspection. There was no discharge whatever, and the conjunctiva was only moderately congested. The two eyes were exactly alike; the cornea in each eye was steamy, the iris had lost all brilliancy, and in the anterior chamber were a few small shreds of lymph, which had not gravitated to the bottom but lay irregularly on the iris. The pupil in each was occluded by lymph of a light greenish tint, which as it did not overlap the margin of the iris, clearly came from behind it. The iris was pushed forwards, there were no nodules of lymph adhering to it. It appeared clear to me that the disease was not iritis, but rather a general inflammation of the globe.

Our patient was a pallid flabby child, a year and nine months old. Its gums were hot and red, its mouth shewed aphthæ, and

its tongue was rather dry. I was told that it took almost nothing and slept but little. Although looking so ill, I was assured that up to within ten days it had been very active and perfectly well. Its father was a member of the City Common Council, and it had of course had every comfort. It had in fact only recently returned from the sea side.

In searching for some cause for this most unusual condition, I made special enquiry as to whether any exanthem had preceded the ophthalmitis. On stripping the child we found a few small scars, very like those of chicken-pox, and its mother stated that ten days ago there had been a slight rash out consisting of "small watery heads." There were other children in the family and they had all remained well. The mother had been recently confined and still kept her room, the child's early symptoms had therefore been somewhat overlooked.

It did not appear to me that there was room for active treatment by mercury. We ordered belladonna fomentations, with cinchona and chlorate of potash internally. Three days later the flakes of lymph in the anterior chamber had almost disappeared, but the pupils remained as before. The tension of the globes seemed already somewhat diminished.

After this the corneæ regained perfect transparency, but the globes softened, and became reduced in size. In each the vitreous was opaque, and eventually the lens also shared in the change. The irides remained dull. The child recovered its health slowly. It is at present quite well, but quite blind, and with clear corneæ.

Remarks.—I have seen but very few cases at all similar to this. In some respects the form of ophthalmitis resembled what I have seen in pyæmia, but it is very rare in that disease for both eyes to suffer. We had besides no definite indications of pyæmia; the child was very ill, but no abscesses occurred elsewhere. I think it exceedingly probable that varicella had been present, and this exanthem is, I believe, much more than any other liable to be followed by severe complications of a pseudo-pyæmic nature. I have repeatedly known multiple abscesses and severe illness follow chicken-pox. Dr. Mackenzie has given us a most excellent account of an epidemic of fever in Glasgow, in which many patients suffered from ophthalmitis of a kind somewhat similar to that which occurred in this case. De-

structive inflammations of the eye have also not been infrequent during the recent prevalence of spotted fever with spinal meningitis in Dublin.* But in most of the recorded cases of ophthalmitis from fever the inflammation was not symmetrical.

As regards treatment I may state that the child was so ill that I did not venture to give mercury; we contented ourselves with the local use of atropine, and chlorate of potash and bark internally. At the date of my first visit the eyes were clearly lost.

No. XXXIII.—*Paralysis of the right fifth Nerve fifteen years after Syphilis—Inflammation of the Cornea—Careful Treatment from an early stage—Entire loss of the Eye.*

I saw Mr. S., a gentleman from Dublin, with Dr. R., on October 24th, 1867. He had been under Dr. R.'s care for some weeks, and had for long been out of health under the treatment of different physicians. His ailments had been chiefly in connexion with the head, violent headaches, &c. Dr. R. had suspected syphilis, and had obtained from Mr. — the admission that he had had a chancre fifteen years ago, which was followed by secondary symptoms, for which he was treated by M. Ricord. Since then he had married and his wife had borne healthy children. The reason for now consulting me was that one eye had inflamed. Dr. R. told me that the attack on the eye had been preceded by great irritation in the side of the nose and pain in the forehead.

I found that the first division of the fifth nerve on the right side was quite paralysed, and the second partially so. He could not tell when his eye was touched, nor when a pin was thrust into the skin of his forehead. The right side of the upper lip was numbed, but not entirely so, and in the chin he could feel well. The masseter and temporal muscles were in good condition. The eye had been inflamed for a week. The conjunctiva was much congested and swollen, and the lids were also swollen and loaded with vessels. There was a superficial ill-defined hazy patch in the centre of the cornea. Ulceration was commencing, but as yet no marked ulcer had formed.

* See an able paper by Mr. Wilson in Dublin Quarterly Journal.

The pain had already been somewhat relieved by iodide of potassium. We carefully protected the eye, and continued the iodide in full doses (thirty grains three times a day). On more careful enquiry there seemed to be not the least doubt as to the disease being syphilitic. Several times during the long interval since the original disease he had been treated by specific measures for periosteal swellings, &c. A few months before I saw him he had had a slight epileptiform attack; he had been salivated on several occasions, and had always found it remove his symptoms. Until I examined him he had no idea that one side of his face was anæsthetic.

It would be tedious to record in detail our treatment, it may suffice to say that from the first I kept the eyelids closed by plaster and covered with lint and bandage. Sensation in the parts supplied by the second division and in the side of the nose returned. At first the ulcer seemed inclined to heal, and then it relapsed. Then hypopyon appeared, and this was absorbed but again quickly returned. From this stage the progress was steady from bad to worse. In addition to the iodide we gave small doses of grey powder for three days and to mild pyalism. This was not tried until the corneal ulcer and the hypopyon were well advanced, and it did not appear to influence the case.

When at length the anterior chamber was half full of purulent lymph, and almost the whole cornea involved in the ulcer, it was decided as a last resource to perform iridectomy. Some difficulty was added to the operation by the bulging rim of chemosis. The anterior chamber filled with blood; only about half the lymph was removed. The operation was done without chloroform and caused not the slightest pain. The destructive processes went on more rapidly after the operation than before. The cornea quickly gave way, and in a week the whole of it had disappeared, leaving the iris exposed. On December 10th I excised the iris and ciliary rim of sclerotic in order to allow of better healing. The lens had already escaped, and the vitreous was opaque with lymph. The operation was again quite painless. At this stage the eyeball was pushed out of the orbit by swelling, such as in other cases of severe pan-ophthalmitis, and although the globe was anæsthetic there was much aching around it.

The process of healing was rather tedious, owing to the con-

tinued suppuration from within the globe. At length, however, it healed soundly. He now wears an artificial eye. The conjunctiva is still quite devoid of sensibility.

Remarks on the Case.—The first point to which I have to ask attention is one of anatomy. Our patient quickly recovered sensation in the cheek, lower eyelid, and side of nose, indeed in these parts the loss had never been complete. During the time that the inflammation of the cornea was at its height, and whilst that structure was totally devoid of sensation he could feel in the lower lid and side of nose almost as well as on the sound side. Now the nerve which gives sensation to the lower part of the nose and its tip is the oculo-nasal, the same that gives a branch to the lenticular ganglion. It is probable that this nerve had been restored, and therefore probable that it has nothing to do with the sensibility of the cornea and conjunctiva. Although sensation was good in the lower two-thirds of the side of the nose, it was wholly lost at the upper part just adjacent to the inner canthus, the part supplied by the supra-trochlear branch. This abrupt limitation of the sensory paralysis and its results seems to me well worth keeping in mind in reference to what occurs in herpes ophthalmicus, in which we often see the eruption limited in the same way. In that disease I believe that it is the clinical fact that the eye does not inflame materially unless the eruption comes out on the side of the nose to its tip, the very part which escaped in this instance.

My next point is to note that the inflammation had no peculiarities excepting that it was wholly without pain, and wholly without intolerance of light. It is startling to see a man with an acute ulcer on his cornea and great congestion of the eye opening the lids in a full light without the slightest inconvenience and allowing you to examine it to any extent. But this absence of irritability was the only feature in which the inflammation differed from that of a healthy cornea. We had first a superficial ulcer, then a larger and deeper one, and next hypopyon. As more of the cornea became involved the conjunctival congestion increased, and chemosis was produced, and when finally the cornea gave way the adjacent irritation increased, and we had such swelling of the orbital cellular tissue that the eyeball was pushed forwards out of the orbit, so that the lids could not be closed. The whole process to entire destruction of the cornea

occupied about three weeks ; rapid changes were noticed several times ; twice the ulcer almost healed and then relapsed, and once hypopyon, to the extent of a large drop of pus, wholly disappeared in twenty-four hours. The absorption of the hypopyon occurred whilst he was using hot fomentations, so hot that they scalded his forehead and nose and brought out vesications.

As regards the treatment of inflammations in paralysed parts, we may note first that two of our most useful remedies in other cases are here of no value. I allude to counter-irritation and to anodynes. Opium is undoubtedly most efficient in the treatment in other eyes of corneal ulcers which threaten perforation, but here we had no pain to subdue and no irritation to control. It is highly probable that blisters and other counter-irritants act only through the reflex endowments of the nervous system, and that they, too, can have no effect in an inflammation in which irritation of sensory nerves has no part.

It may be doubted whether the application of cold to tissues deprived of nerve influence would be safe, and a degree of anxiety, though less would also attach to the use of heat. In this case we tried local heat most zealously in the form of fomentations, and at first with apparently very good results, but afterwards with none. Would the *continuous* use of heat have been better, say in the form of a hot-water bag ?

Local depletion by leeches was twice resorted to, but with no perceptible effect. Our main aim seemed to be to try to restore the nerve as quickly as possible, and meanwhile to protect the eye. These objects we carefully attended to, but with the lamentable want of success which I have recorded.

During our attendance on this case, our unfortunate patient frequently pressed us with the question, was it possible that the other eye might suffer in a similar manner ? He was, of course, dismayed at finding that the disease seemed so little under the control of treatment. Mr. Dixon and Mr. Critchett, as well as myself, had to answer his question, and we all replied clearly that we had never known both eyes suffer. During the last month, however, I have seen an example of symmetrical paralysis of the fifth nerves from syphilis, and symmetrical inflammation of the cornea as a consequence. The patient was a gentleman sent to me by Dr. Barker, of Melbourne, Australia, and I may probably, at a subsequent time, publish his case.

Injury to one Eye followed by Reflex Iritis in the other—Excision of the injured Globe—Iridectomy for the recurrent Iritis—Statement of result, seven months later.

Cases of sympathetic ophthalmitis are amongst the most anxious with which we have to deal, and but too often lead to the worst results in spite of all that we can do. The fact that the eye which we have to treat is usually the only one left to the patient, of course adds greatly to the surgeon's sense of responsibility. I record the following case as a most valuable fact in favour of the timely performance of iridectomy in order to prevent recurrent attacks of iritis. It will be seen that the excision of the eye originally injured, and from which the inflammation of the other had its rise, did not prevent the continuance of the disease. Under these circumstances, with the eye already much damaged and in a most critical condition, the iridectomy was performed. Sufficient time has since elapsed to fairly test its effect, and we are justified in considering that it has saved the organ.*

W. Wilson, a healthy labourer from Lincolnshire was admitted on Jan. 21st, 1867, his right eye having been lost by an injury three months previously. On October 9th, he was chopping sticks, when a piece flew up and struck his right eye. The iris and ciliary region were wounded. He had no sight from the time of the accident, and the eye remained hot and painful, but without any acute inflammation. A month after the accident his other eye became weak and watery. He described it as feeling hot, and he was much troubled with lachrymation. The pain was sufficient to keep him awake at night. When he came up to the hospital two months later, the reflex inflammation of the left had commenced. The pupil of this eye was almost closed. The iris was muddy and swollen, and there was a distinct zone of ciliary congestion. The lost eye was soft and shrunken, its pupil completely closed. It should be stated that

* The reader may be interested in referring to an abstract of a paper on this subject, by Von Græfe, given in our Periscope.

almost from the commencement of the reflex inflammation in the left, the pain in the right had ceased. Although however he had no pain in the right, I felt no hesitation in advising him to have it removed, and this was accordingly done. On examining the globe afterwards, I found the iris and ciliary processes on the outer side involved in a puckered cicatrix. The lens and vitreous were absorbed, the retina was wholly detached and a thin brownish fluid occupied the space between the choroid and retina.

To continue the case as regards his left eye, I may state that we administered bichloride of mercury, and used atropine freely, with the result that the iritis quickly subsided, and all traces of congestion and irritability ceased. He could now see to read although the pupil was occluded in the centre. In about a fortnight he returned home. Five weeks later he returned to the hospital with a relapse of the iritis. There had been no pain whatever in the orbit from which the globe had been excised. The recurred attack of iritis was rather severe, and there was much ciliary congestion. It subsided quickly under the use of bichloride of mercury and atropine. The tension of the globe was slightly increased, but not much. I advised him to have an iridectomy done in the hope of preventing fresh recurrences of inflammation, and to this he consented.

March 14.—The pupil was irregular and occluded by lymph at its lower part. He could read No. 19 (J.). An iridectomy was performed upwards.

18th.—A little fresh iritis had been excited by the operation, there was a little lymph in the new pupil, and slight inflammation about the edges of the wound. He had a little pain the first night after the operation. He could only read No. 20 (J.).

21st.—He could read No. 16 (J.).

25th.—His sight was still better, but he could not quite read No. 14 (J.). There was less irritation about the eye. He now returned home.

May 30th.—He had had no relapse. There was still slight ciliary congestion, and the pupil was occupied by lymph, which prevented his seeing well. He could only read No. 16 (J.).

In October he again came to town at my request. Since his last visit there had been no recurrence of irritation in the eye, and he had been able to follow his occupation. There was now

no congestion whatever. He read 16 (J.) easily, and with + 14 could read 8.

I saw him again ten months after the operation, and he still remained free from relapses.

No. XXXIV.—*Double Pan-ophthalmitis in an Infant—Pyæmia?—Abscesses in Cellular Tissue of various parts—Destruction of both Eyes.*

The following case came under my observation at Moorfields, in September of the current year.

George Jones, æt. 18 months, was a healthy infant until ten weeks ago, when he was attacked by “an inward fever.” A month later a succession of abscesses in the cellular tissue occurred. None of the joints were involved. Both globes inflamed and suppurated. The lids were greatly swollen, and he appeared to suffer extreme pain in the eyes.

No other illness occurred in the family. He is now only just well of the abscesses. He is emaciated and very pale. The left globe is shrunken, and the entire cornea lost. The right cornea is perforated by a large central ulcer, into which a button of discoloured iris, the size of a pea, bulges.

He now eats well, and does not appear to be in pain.

This case is of some interest in connexion with that recorded at page 146. In this, however, the corneæ and not the deep parts suffered.

AN ACCOUNT OF SOME PATHOLOGICAL SPECIMENS
RECENTLY ADDED TO THE MUSEUM OF THE ROYAL
OPHTHALMIC HOSPITAL.

By BOWATER J. VERNON, F.R.C.S., Curator.

SPECIMEN I.

THE right eye of a lad, æt. 11 years, removed by Mr. Critchett in August, 1867.

Intra-ocular growth Invading the Tissues of the Orbit.

History.—All that could be gathered from the lad and from those who brought him, was that the eye had been blind after an attack of inflammation when he was a baby, but had been no trouble to him until the last few weeks; during that time, however, it had become prominent and everted, and occasionally very painful.

The eye was very prominent and enlarged with a T + 2, but the opaque scar-tissue, which represented the cornea, did not allow any very thorough examination. Excision of the globe was advised.

There was some difficulty in completing the operation, as the eyeball was embedded in a firm mass of a growth, which filled up the back of the orbit.

The eyeball and tumour were examined by a vertical section, and, in order, to show the colour of some of the tissues, a tinted sketch of the fresh section was made.

The specimen showed a new growth within the globe, which having made its way through the sclerotic, surrounded it on its under and posterior aspects. The situation of the iris and ciliary body were marked by the dark line of pigment at the lower part of the specimen, but there were no traces of the cornea, anterior chamber, or lens.

Another dark line running horizontally across the solid contents of the globe divided them into two very different portions,

and apparently represented the remains of the choroid which had been driven inwards.

In front of this line the tissues were very vascular, and blood oozed from many small pinkish-coloured points; the whole of this part, too, was studded with small glistening yellow earthy deposits.

A microscopic examination of this portion showed it to consist of imperfect cells of different sizes, with a large quantity of a granular intercellular substance, this latter was full of capillary blood-vessels. The bright yellow specks above-mentioned were of an earthy nature.

The other portion was of a greyish colour very translucent, tolerably firm, and entirely destitute of new blood-vessels and the yellow earthy deposits, the new tissue, of which it was composed, seemed to have blended with the choroid and retina, though not a trace of the latter could be found, and after filling the posterior half of the globe, to have made its way out and spread around it in the orbit. There was no appearance of any actual perforation of the coats, but the growth seems to have chosen the course of the optic nerve for its exit.

A distinct portion of a similar substance was found in the apex of the orbit.

The appearances of this part of the growth under the microscope were very striking, apparently it was made up of small and distinct cells, of uniform size closely packed together, with one or more nuclei, and spherical in shape, but with hardly a trace of any intercellular substance. There were no traces of capillary vessels or any evidence of earthy degenerations. The elements which composed the growth in the orbit had exactly the same appearance.

SPECIMEN II.

A firm yellow Intra-ocular Growth of Uncertain Duration.

The left eye of J. H., æt. 10 years, removed by Mr. Critchett in September, 1867.

History.—The lad was very dull and stupid, and had never complained of his eye until seven weeks before seeking advice at the hospital; at that time he thought he “had a cold in it.”

This condition of things lasted about three weeks, and then he found he "was blind of that eye."

When he came to the hospital the globe was distended laterally, its T + 2, the deep vessels of the sclerotic distended, and there was a good deal of congestion of the conjunctiva and lids, the lens was opaque, and he had no perception of light. As he was in a good deal of pain the eye was removed at once.

A vertical section through the optic nerve and eyeball showed a firm lobular growth of a yellow colour, springing from the entrance of the optic nerve, and filling the lower two-thirds of the vitreous chamber, the remaining part of this being filled with flocculent lymph.

The growth consisted of two distinct lobes, the smaller and posterior lobe, springing from the termination of the optic nerve, had driven the choroid before it, then, bursting through this, had spread itself into the vitreous chamber, forming the other and larger lobe, and reaching as far forwards as the back of the lens. The lens was opaque, but in its proper position.

On microscopic examination no trace of the retina could be found, the growth was formed almost entirely of pale but distinct and well-formed cells (very like white blood cells but smaller), with here and there a well-marked intercellular matrix of very fine fibres, and a few spindle-shaped cells.

The "flocculent lymph," mentioned above, contained very many perfect but much larger cells, full of nuclei, and very many smaller cells in different stages of development, all of them pale, and hardly if at all connected together.

Although no specimen could be preserved, the account of the post-mortem examination of a case of intra-ocular growth spreading backwards to the brain, and causing speedy death, seems worthy of record here.

W. I., a sturdy little boy, æt. 4 years, was brought to the hospital in September, 1866, on account of a "yellow appearance" in his right eye, which his mother had noticed for some few weeks.

Examination with the ophthalmoscope showed very plainly the retina detached and bulging forwards. The vessels on the detached retina were very evident, and though the structures behind the retina were somewhat transparent, it was considered probable that the detachment was due to some growth behind it.

For some months the child was lost sight of, and when seen again by Mr. Hulke the globe was prominent, everted, and much restricted in its movements. It was assumed that the growth had now involved the orbit, and, to give the child a chance, Mr. Hulke removed the eye. As the hospital was full, the operation was performed at the Middlesex Hospital. At the time of the operation, though there was no growth in the orbit, yet the optic nerve appeared much thickened up to the optic foramen. The eye was examined by Mr. Hulke, and has been thus described by him in Vol. XVIII Pathological Transactions :—

“On dividing the eye after hardening it in alcohol, it was firm, and filled with a pinkish-grey vascular growth specked with small white dots of earthy and fatty degeneration. The growth sprang apparently from the optic nerve and retina, and had infected the choroid and sclerotic at an early period before it had distended the eyeball.

“The histological elements were small, round, roundly oval, and spindle-shaped cells, ranging from $\frac{1}{4300}$ '' to $\frac{1}{2730}$ '' in diameter, with one or a couple of minute nuclei, and a faintly granular cytoplasm, and these cells were embedded in a scanty intercellular substance, homogeneous, finely granulated or obscurely fibrillated. None of the normal retinal tissues were discernible, but the elastic lamina of the choroid was recognizable, and in the portions of tumour involving the choroid pigmented cells were not unfrequent.”

At first the case did well, but in January 1867, a month after the operation, from the bulging of the eyelids and walls of the orbit it was evident that a recurrence of the disease had taken place; in February a vascular sloughy-looking mass had protruded from the orbit, and there appeared to be considerable enlargement of the frontal and right temporal region. The child did not appear to suffer, but became extremely emaciated, its weakness at times being much increased by hæmorrhage from the growth, which had reached the size of a large orange, and was of a most repulsive character.

On September 11th, in Mr. Hulke's absence, the mother told me the child had died on the 7th, after having been very drowsy, sick, and very much convulsed during the last days of his life.

I went at once and examined the head, a task of some difficulty, as decomposition had been very rapid. On removing the

scalp I cut through a soft pink mass like brain-substance lying between the pericranium and the skull at the situation of the posterior fontanelle. At first it seemed as if this had made its way through the bone from within; this, however, was not the case, for when scraped away the bone beneath it was smooth and intact; the patch was about the size of a half-crown in extent and half an inch in thickness. Along the course of the superior longitudinal sinus were several smaller patches of a similar nature, the skull cap was very thin, and when held to the light it was easy to see that in places the diploe was filled with the same pinkish-looking substance. On removing the dura mater the entire brain was softened and decomposed; these changes were more advanced in the right hemisphere, this part appearing to have been hollowed out into a sloughy irregular cavity which contained some recent blood clots. There was a direct and ragged communication between the cavity of the orbit and the sloughy part of the brain, and the finger could readily be passed into the mouth, nose, or antrum, owing to destruction of the orbital walls. I could find no trace of optic nerve.

There were some enlarged glands behind the right ear; these, with some of the brain-like deposit beneath the scalp, were removed for more minute examination.

Of the microscopic appearances of the gland tissue I could not lay much stress, but the morbid deposits undoubtedly consisted of very simple spherical cells of a uniform size, without any intercellular substance.

SPECIMEN III.

The right eye of a woman, æt. 66, removed by Mr. Critchett, October, 1867.

Melanosia, associated with symptoms of Glaucoma.

History.—The eye first failed two years ago. At that time she saw “flashes of light” and “cobwebs,” suffering occasionally from severe pain in the brow and over the whole of the right side of the head. Since then her sight had been gradually lessening, and during the last few weeks had been totally lost.

A very severe attack of pain had induced her to apply at the hospital.

The globe was shrunken, flaccid, and the cornea very hazy, the lens was opaque and was displaced downwards, where it might be seen swinging to and fro.

A small black growth was attached to the under and posterior part of the sclerotic, on section through this the white sclerotic showed no trace of perforation; the contents of the globe consisted of a greyish black mass the size of a small nut, corresponding in its situation within to the smaller and darker growth without the globe, situated behind and detaching the retina.

This inner substance consisted of what appeared to be débris of cells, with a considerable quantity of pigment scattered throughout it, but no well-defined cell structures.

The external growth was composed of large and well-formed cells, irregular in size and shape, but all closely packed with very dark pigment.

SPECIMEN IV.

The right eye of a man, æt. 35, removed by Mr. Soelberg Wells, September, 1867.

Hæmatocele of the Eyeball, Simulating a Melanotic Tumour.

History.—Five months before coming to the hospital he received a severe blow upon the eye while chopping some wood; there was no wound, but he was unable to see afterwards. Two months after this he had another but very slight blow upon the eye, and from this time it became painful and began to enlarge.

He came to the hospital with the lids swelled and dusky, the eyeball very prominent, very much enlarged, and in the upper ciliary region there was a staphylomatous bulging of a deep black colour, and very tense. He was in considerable pain, and said at times he had suffered very severely.

It was thought that the case was one of rapid melanosis, and immediate extirpation of the globe was advised.

During the operation it was impossible to distinguish the ocular muscles, and from the large size of the globe the dissection was very difficult, so much so that in spite of all care

it was wounded posteriorly, this was followed by a gush of bloody fluid and collapse of the globe.

The eyeball on examination was found to have been reduced to a mere bag, in which hardly any traces of the normal structure of the globe could be recognized, its sole contents seeming to consist of a dark coloured fluid with some partially decolorized blood clots adherent to the sclerotic. The sclerotic appeared to have been distended and then to have split in many directions, corresponding to those rents, the continuity of the wall of the bag had been maintained by the orbital fascia, and the expanded tendons of the muscles. The sclerotic was much thickened, very brittle, and its inner surface of a yellow colour, an appearance much resembling that of an atheromatous artery.

Remarks on Specimens I, II, III, and IV.

The rough appearances no less than the minute examination of specimen I, lead to the belief that it is an example of a soft glioma, and not a true cancer, commencing probably in the framework of the retina or the optic nerve. The peculiar features it presents correspond in a remarkable manner to the description given of such tumours by Virchow, and with the appearances of the tumour examined and described by Mr. Hulke in the Pathological Transactions.

In specimen II probably is an example of a more mixed kind of tumour, slower in its growth, and less certainly springing from the retina, what Virchow calls a glio-sarcoma.

Specimen III has at least two points of interest—what was the connexion of the glaucomatous symptoms with the presence of the new growth? were they the consequence of the growth and increase of the tumour, or is there any especial tendency towards the appearance of new growths in eyes which have been destroyed by glaucoma? Probably it will be impossible to answer this question finally until an eye shall have been watched through all the stages of glaucoma, a condition of things not likely to occur. The other point of interest is, the manner in which secondary tumours are formed outside the coats of the eye-ball, when very careful examination can detect no actual perforation. In cases where the growth without the eye has reached any considerable size, it is always easy to see a distinct

continuity between the growth without and that within the eye, but where the secondary tumour is very small, it is often impossible to detect any continuity of the two growths. In conversation with Dr. Knapp, of Heidelberg, he stated his belief that the secondary growth was due to migration of cells through the coats of the eye, and not by means of the connective tissue around the blood-vessels or lymphatics.

SPECIMEN V.

Tubercular deposits in the Choroid in connection with acute Tuberculosis.

History.—(Kindly supplied by Mr. S. Wells.)

M. J. P., a little girl *æ*t. 8, was admitted on November 5th, 1867, into King's College Hospital under the care of Dr. Garrod, with symptoms of acute tuberculosis. She had become rapidly emaciated during the last month, and had during that time suffered from dyspnoea and dry cough. On admission there was great febrile disturbance, pulse 132, respirations 66, temperature 101°. Slight dullness of left side of chest, and crepitation about the second intercostal space. November 6th.—Temperature 106, pulse 148, respiration 96. Urine acid, no albumen. Puerile respiration on right side, slightly tubular on left. The eyes were examined by Mr. Soelberg Wells with the ophthalmoscope, and tubercles in the choroid were diagnosed. November 11th.—The patient grew rapidly worse and died on this day.

Post mortem examination by Dr. Kelly.

The brain substance was apparently normal, but on the superior aspect of the left hemisphere were seen two or three small opacities in the pia mater. Both lungs were filled with miliary tubercle. Liver and heart healthy, kidneys contained tubercles in their cortical substance and were throughout congested. Capsule of spleen had some tubercular (?) deposits, the organ itself being healthy. The mesenteric glands were somewhat increased in size and number, and some solitary glands of small interstices were enlarged. The surface of the peritoneum was healthy.

Examination of the eyes during life.

Mr. Soelberg Wells found that the eyes appeared externally

quite normal. The sight was perfect (No. 1 Jaeger). The field of vision normal. The refracting media perfectly transparent. With the ophthalmoscope it was found that the optic nerve and retina were healthy, the retinal veins slightly dilated; the outline of the disc perfect. In the choroid—which was otherwise perfectly normal—were noticed numerous small, circular, prominent greyish-white nodules, which were chiefly situated in the vicinity of the optic disc, more especially in the region of the yellow spot. Towards the periphery of the fundus they were more sparsely scattered. The epithelium of the choroid around the nodules was only very slightly altered in appearance, the cells being evidently opened up or parted aside by the nodules, and there was no agglomeration of pigment around the latter, but the thinned portion of the epithelium passed insensibly over into the normal condition. At some points a nodule could be seen lying beneath a retinal vessel which passed distinctly over it. The nodules were prominent, but whether or not the retinal vessel was arched forward by the tubercle could not be accurately determined, as it was quite impossible to distinguish with certainty, as to the presence of a parallax, on account of the restless movements of the patient's eye. The condition was very similar in both eyes.

Examination of the Eyes.—After death the eyes had been preserved for two days in glycerine and water, and were soft and flaccid.

On cutting them open, the vitreous humour escaped like water, the retina was softened and detached, and the layer of pigment-epithelium lining the choroid had been loosened and carried off with the vitreous humour.

(Both eyes were placed in a weak solution of chromic acid. The right eye has not been any further touched, *the left* has been examined minutely.

The anterior portions of each showed nothing to note, and have not been preserved.)

Both eyes presented similar appearance when examined with the naked eye, or still better with a pocket lens. The inner surface of the choroid was studded with a number of pearly white spots; twenty or thirty could be counted in each eye, situated around the entrance of the optic nerve, more numerous on its outer than on its inner side, and much more thinly scat-

tered over other portions of the fundus; the largest were of the size of a millet seed, the smallest no bigger than a pin's point; their surfaces were smooth, and though some of the largest of them appeared to be elevated, they could not be detached. Their outlines were distinct except where one or two of the smaller ones seem to have become blended together.

When the choroid was separated from the sclerotic, the spots could not be seen through the thickness of the choroid. When examined *in situ* with low microscopic powers, it was not possible to trace their connection with any of the larger choroidal vessels.

When higher powers were used—the one employed generally was $\frac{1}{8}$ th inch—the following appearances were noted:—Many sections were made through the patches and the surrounding choroid. In all, the layer of pigment-epithelium was almost entirely absent, but in all, the elastic lamina of the choroid was perfect and quite normal. Internally to this there were large numbers of colourless cells of uniform size, closely packed together, each containing one or more nuclei, and except that they were smaller, not to be distinguished for the cells of pus or lymph.

Where the section had been made through the largest patches, it was evident that the apex of the mass of cells was appreciably elevated above the level of the surrounding tissues, and that the prominence was due to these cells being amassed between the elastic lamina and the chorio-capillary tissue.

The outer layer of these cells blended gradually with the stroma of the choroid, and cells of a like character and appearance were scattered thickly amongst the dark pigment cells of this coat.

At this spot however, the cells were not so uniform in size, here and there were larger cells, full of nuclei, and the cell-walls could not so easily be distinguished.

PART II.

A Periscope

OF

CONTEMPORARY OPHTHALMIC LITERATURE.

ON THE ETIOLOGY OF GLAUCOMA.

By Dr. Adamink, Assistant in the Ophthalmic Clinic of the University of Kazan, Russia (Annal. d'Oculistique, July and August, 1867, page 1).

DR. ADAMINK believes that he has made an important advance towards a correct knowledge of the stages which constitute the glaucomatous process. He thinks that it is in alterations of the extra-ocular circulation that we must find the explanation, hitherto vainly sought in other directions. "We must admit," he writes, "that increase of tension is not the essential cause of glaucoma. It is much more reasonable, on the contrary, to suppose that the increase of tension is itself the result of the peculiar distribution of blood." Thus he refers the first change in tension to impediments offered by the sclerotic to the escape of venous blood, and argues that when once increase of tension has been induced, it can never disappear, but will tend (by pressure on the veins) to augment itself. Hence he infers the importance of a temporary relief by iridectomy or paracentesis, which may allow the veins an opportunity for emptying themselves. He explains the different degrees of glaucoma by suggesting that in some only the retinal veins are implicated, in others the posterior choroidal, and in the most acute cases all the choroidal as far forwards as the ciliary body.

He details the results of experiments in which the eye was separated from the external tissues, its arteries being as much as possible left intact, and ligatures being placed on its veins (*venæ vorticosæ*). In these the tension of the globe is found to increase quite up to that of complete glaucoma, but the changes in the retinal circulation do not show themselves so long as the retinal veins are not interfered with. The fact that the chief symptoms of glaucoma (distended veins, shrunken arteries, and increased tension of globe) can be produced by irritation to the ciliary region of the cervical cord is mentioned as another proof

that they depend on alterations in blood supply. The one weak point in Dr. Adamink's theory seems to be as to how the sclerotic is so altered as to impede the exit of blood. He speaks of loss of elasticity of the sclerotic, of thinning of it, and the opposite state or thickening, as conditions capable of effecting this result. But surely it is mere conjecture that any such conditions are present in glaucoma.

ON ENUCLEO-DISSECTION OF THE EYEBALL, ETC., ETC.

By Drs. J. and A. Sichel (Annal. d'Oculistique, July and August, 1867, page 56).

THE Drs. Sichel (father and son) have written a paper on what they call Enucleo-Dissection of the Eyeball. The operation differs from the enucleation introduced by Critchett, and now so generally practised, in that, whilst scissors are used for part of it, and the muscles cut within Tenon's capsule, the bistoury is employed for its completion. It is adapted for cases in which there is disease of the tissues surrounding the eyeball, a tumour, &c. In connection with this "*Méthode mixte et nouvelle*," an interesting case is recorded. A young woman, who had lost one eye several years before, from repeated inflammations, applied to Dr. Sichel, with a melanotic growth from its anterior part. The globe with the growth and surrounding parts were excised. The retina was found detached, and the vitreous ossified. The growth was of the kind known as melano-sarcoma. The details of microscopic examination are given. The operation was performed in May, 1863, and as the case is spoken of as a cure, without either local or general return of disease, we suppose the patient has been recently under observation, although this latter fact is not explicitly stated. In the after-treatment bands of adhesion formed, and prevented the introduction of an artificial eye. These were repeatedly cut across, and touched with nitrate of silver, with the unusual result that they were finally got rid of.

TOBACCO-AMAUROSIS.

(The Medico-Chirurgical Transactions, vol. I, 1867.)

THE unusually large volume of Transactions just issued by the Medico-Chirurgical Society contains only one paper bearing upon ophthalmic pursuits. It is a statistical paper by Mr. Hutchinson, containing a three years' experience of the form of amaurosis supposed to be in connection with tobacco. The author carefully distinguishes between cases of secondary atrophy, preceded by neuritis, and those in which the atrophy is primary (at least so

far as the optic disc is concerned). The latter only are the cases tabulated. It is estimated that a hundred cases of this kind are admitted at the Moorfields Hospital every year. The chief fact brought out is the comparative rarity of the disease in women. In a former report on this subject, Mr. Hutchinson had found the proportion to be three women to thirty-seven men, and in the present one we have thirty-four men to only three women. Almost all the men had been heavy smokers, and in a large majority of the cases no other cause could with any plausibility be assigned. In most of the cases there was little or no evidence of disease of the nervous system other than the amaurosis, the patients usually remaining in excellent health. Mr. Hutchinson discusses in some detail the other possible causes of disease which may be supposed to bear unequally upon the two sexes, and is unable to suggest anything more plausible than the tobacco hypothesis. Whilst avoiding the expression of any definite opinion, he yet urges that the evidence is quite sufficiently strong to make it an important duty on the part of the surgeon to advise abstinence whenever the early symptoms of this disease are present. He explains the general immunity of smokers by supposing that tobacco only acts prejudicially in certain peculiar constitutions, just as we know that some persons are easily poisoned by iodide of potassium, belladonna, arsenic, &c.

TUMOURS OF EYE OR ORBIT.

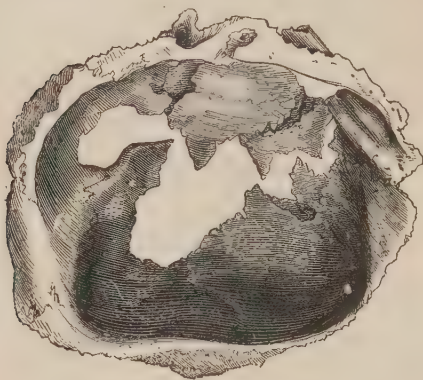
The Pathological Transactions, vol. xviii, 1867.

THE last volume of the Pathological Society's Transactions contains several important records of eye cases, chiefly concerning new growths.

Mr. De Morgan gives us the sequel to his case of successful removal of a recurrent encephaloid tumour of the orbit. In this instance a growth of most formidable character had been removed from the orbit in part by the repeated and very free use of chloride of zinc, the whole of the soft tissues contained in that cavity having been made to slough out. The man was exhibited to the Society in February, 1866, apparently well. He died, however, in July, with a recurred growth in the brain. He had lived a year and eight months after the last operation. Cancerous deposits in addition to the large growth in the skull, were found in the glands around the aorta and adhering to the nerve trunks of the canda equina. This patient during his last illness had complete vertical hemiopia of his remaining eye. The autopsy showed the cancerous growth completely involving the decussation of the optic nerves.

Mr. Lawson records a case somewhat similar to Mr. De

Morgan's, and in which the same kind of treatment was carried out. An elderly woman had her left eye ejected by a scirrhus



Wall of the orbit exfoliated after use of chloride of zinc.

growth behind it; she had also a cancerous wart on the cheek. Mr. Lawson excised the globe, and the greater part of the cancer; he then used the actual cautery to arrest bleeding, and lastly stuffed the orbit with lint, covered with chloride of zinc of paste. So effectually was the latter part of the plan carried out, that the entire orbital wall exfoliated. The patient did remarkably well, and the parts have now

cicatrised.

Wood-cuts are given showing first the exfoliated orbit (in one piece), and secondly the present appearance of the patient.



Portrait of the patient after healing was complete.

It is quite clear from such instances as these that some cases of orbital growth hitherto thought too desperate for remedy, may by bold measures be brought, for a time at least, to a successful termination.

Mr. Zach. Laurence records the case of a man, aged 55, whose left eyeball he removed two years after it had been lost by an injury. A firm buff and partially black growth, the size of half a pea, was found surrounding the optic papilla. Dr. Wilson Fox and Mr. Hulke, who report on the specimen, agree with Mr. Laurence in regarding it as undoubtedly malignant. Many of the cell elements were large, and poly-nucleated.

Mr. Ernest Hart gives a case of fibro-plastic and melanoid tumour of the eyeball. His patient was a man aged 53, who had gradually lost his eye from a blow, six or seven years ago. The eyeball having recently inflamed and become painful, *Mr. Hart* removed the anterior half of it. The man wore an artificial eye with comfort for nine months, and then it became necessary to excise the stump, owing to a growth within it. The sclerotic had been perforated, and the tumour bulged into the orbital tissues. The optic nerve where cut across showed the sheath much thickened, and black matter within it, so that, to use the operator's words, "a nucleus for further growth was perforce left." The patient has as yet no evidence of return.

Mr. Hulke records three important cases of growths within the eye, and gives detailed and excellent reports as to their minute structure.

CASE I.—*Spindle-celled Sarcoma of the Choroid*.—A porter, aged 46. Symptoms for three months before the nucleation. Tumour confined to the globe, and easily seen through the fixed and dilated pupil. The tumour had originated in the choroidal stroma, and its anatomical elements consisted of spindle cells, closely crowded in a scanty fibrillated intercellular substance. The capillaries were remarkably abundant and large. Operation performed October, 1866; patient still well.

CASE II.—A little boy, aged 4, had his right eyeball excised on account of a tumour which grew from the retina and covered the optic disc, involving also the choroid and sclerotic. After enucleating the eyeball, the nerve was found to be diseased, and was accordingly removed close to the optic foramen. There was no disease visible in the orbital tissues, but as a precautionary measure chloride of zinc paste was used. The wound healed with a depressed scar, preventing the wearing of an artificial eye. *Mr. Hulke* describes the specimen as one of retinal glioma, but appears to believe that its elements originated independently in the several coats. He adds that retinal glioma differs from cancer in the non-occurrence of distant infection, and the presence in the growth of intercellular substance. It is a disease peculiar to childhood.

CASE III.—A woman, aged 45, had her left eyeball removed on account of a melanotic growth from the choroid. Her symptoms had only been present for four months. The tumour was wholly within the eyeball.

ON RETINAL CHANGES PRODUCED BY EMBOLUS.

By Dr. Ph. Steffan, of Frankfort-on-the-Maine, Arch.f. O., xii, 1.

DR. STEFFAN relates the case of a clergyman, 57 years old, of strong frame and healthy aspect, who summoned him at 8 in

the morning on the 29th of October, 1865, having lost the sight of his left eye during the night. The patient had been under treatment for a defect of the right eye, and the left was known to be of normal vision and only slightly presbyopic. Dr. Steffan found the vision reduced to quantitative perception of light in the central, upper, inner, and lower parts of the field; but in the outer part fingers could be counted at from 3' to 4', and single characters of 20 Jaeger deciphered through a 6" lens. The ophthalmoscope displayed only very thin arteries, and veins seemingly pointed at their exit. On the 1st of November (4th day) the vision remained as at first, but a white film, covered the retina; this film was marked, and somewhat striated, around the papilla, still more marked, and of milky aspect, around the macula lutea, the centre of which appeared as a bright red spot. Vessels as before. On the 4th of November (7th day) the white film had increased, so that the margin of the disc was no longer clearly defined. On the 6th (9th day) vision was a little better, letters of No. 19 being deciphered on the outer side through a 6" lens. The white film somewhat lessened; two small extravasations of blood on the margin of the disc, one below, the other on the outer side, of the inverted image. November 11th (14th day), vision as before, considerable diminution of the white film, so that the disc was once more sharply defined, the extravasations disappearing. November 16th (19th day), vision as before, a mere trace of the film remaining, extravasations disappeared. November 19th (22nd day) vision improved, with + 6 reads No. 18 Jaeger. Signs of commencing atrophy in the disc; still a trace of the film around the disc and macula lutea, the centre of the macula still bright red: the arteries as fine as hairs, the veins distended as at the beginning. From this time until April, 1866, examinations were made weekly. By December 9th the last trace of the white film had disappeared, and single words of No. 17 were read with + 6. By December 13th the bright redness of the macula was diminishing, and letters of No. 16 were read with difficulty. By December 27th the macula no longer appeared abnormal, and letters of No. 15 were deciphered. The arteries retained their diminished size, the veins were less distended, and exhibited the phenomenon of blood movement in intercepted columns, as described by v. Graefe and E. Jaeger.* Between December and April vision improved so much that the patient deciphered single letters of No. 14.

Assuming from this history the existence of an embolus, the author notes the absence of heart disease, and attributes the formation to some local lesion of one of the cranial arteries.

The ophthalmoscopic appearances were most important in the regions of the macula and of the disc. In the former the bright red spot, bordered by milky opacity, in the latter the opaque

* See Carter's translation of Zander, p. 135.

striation of a milky ground, were the points chiefly noticeable. The author assigns reasons for referring the striation to the fibrous layer, the milky opacity to the layer of ganglionic cells of the retina, and he combats Blessig's notion of fatty degeneration as a cause of these changes, on the ground of their speedy appearance and their eventual removal. The redness of the macula he attributes to hæmorrhage into the choroid, seen through the central and most transparent portion of the retina. The probable place of the embolus is discussed at considerable length, and the author is of opinion that obstruction of the central artery of the retina alone would be insufficient to explain the results, and would be repaired by the collateral circulation. He conceives the well-known case recorded by Schneller, in which partial recovery followed, to be an instance of this kind, and he recounts a history of the disorder that had attacked the right eye of the present patient as being probably of similar character. He thinks that an embolus that produces blindness must block up many or most of the posterior ciliary arteries, as well as the central artery of the retina. Such questions must await their final solution from post-mortem examinations, but the conclusions set forth in the paper under consideration are based upon careful and exhaustive reasoning.

TUMOUR OF THE ORBIT AND BRAIN.

By Prof. v. Graefe, Arch.f. O., xii, 2.

THE subject of this case was a girl, six years old, a native of Aleppo, brought to the Professor in the autumn of 1864, on account of protrusion of the left eye. Early in her third year she fell, and struck her head severely on a staircase; and four weeks later suffered from feverish illness, which lasted fourteen days, and terminated in apparent recovery; but was soon followed by some deviation outwards of the left eye. By her fourth year the squinting eyeball began to project; and for six months its vision had gradually failed. The child had been free from pain and intellectual disturbance. When seen by Von Graefe she was of remarkable beauty, with blooming complexion, elastic skin, well developed muscles, and good spirits. Careful inquiry failed to discover any symptoms of disordered health. The right eye was perfect; and the only discoverable disorder was the protrusion of the left. This protrusion measured eight lines; and, especially during the last few weeks, the eyelids in closing were liable to pass behind the equator. The protrusion was caused by an orbital tumour, firm, but not of scirrhus hardness, with an anterior surface of uniform convexity. The movements of the globe were greatly restricted; but rotation

outwards, downwards, or upwards could be performed to the extent of a line; and the centre of movement was coincident with the centre of the globe, showing that there could be no great amount of adhesion of its posterior surface to the tumour. Vision was limited to the perception of a bright lamp at 6 inches distance, over a small portion of the temporal side of the field. The ophthalmoscope showed marked neuro-retinitis and swelling of the disc, with considerable mechanical hyperæmia.

There seemed no ground for refusing to operate. The existence of a growing tumour could not be doubted. The integrity of the eyeball, except for the neuro-retinitis produced by pressure, the preservation of some muscular action, the absence of scirrhus hardness or irregular surface of the tumour, and the healthy aspect of the child, all encouraged the hope that the tumour was defined and benignant. The absence of cerebral symptoms, the normal condition of the mental functions, the perfection of the vision, movements, and appearance of the right eye, all rendered it improbable that the tumour extended to the brain.

Prior to the operation a careful examination was made under chloroform, after luxation of the globe. The tumour was found to lie entering within the cone inclosed by the recti muscles, and the optic nerve was lost in its anterior surface. The globe being removed in the ordinary way, and a thin layer of adipose tissue divided, the surface of the tumour came into view. Its sides were found to extend to the walls of the orbit at several points, but were nowhere adherent to the periosteum. It was easily enucleated, except for one long process, which seemed to include the whole of the orbital portion of the optic nerve, and which was afterwards excised up to the optic foramen. For four days all went well, but on the fifth day sudden collapse occurred, followed by temporary recovery. On the tenth day collapse, followed by irregular pulse, acute headache, coma, and death on the twelfth day from meningitis.

The tumour was pronounced by Virchow to be glioma; and seemed to be completely limited. From this circumstance, and from the fact that the symptoms of meningitis only appeared ten days after the operation, when the orbital wound was already healing, it was surmised that some independent source of mischief would be found within the brain. This expectation was realized by the discovery of a tumour as large as a walnut, situated at the base of the brain, close behind the crista galli, and connected with another, more than twice its size, in front of the left corpus striatum. These tumours were described by Virchow as neuroglioma; and no union could be traced between them and the tumour of the orbit. The one seated at the crista galli completely enveloped the chiasma, and a portion of the right optic nerve, insomuch that the nerve fibres could not be certainly distinguished from the morbid growth around them.

V. Graefe remarks at some length upon the remarkable fact that such tumours should not only fail to produce symptoms from which their presence might be suspected, but that they should even fail to produce any symptoms at all. He points out that the symptoms of cerebral tumours usually depend, first, upon the interruption of the conducting function of the fibres invaded; secondly, upon the irritation of surrounding parts, often propagated along the nerves as neuritis descendens; thirdly, upon the pressure exercised upon blood-vessels, by which the nutrition of distant parts of the brain may be affected; fourthly, upon the increase of intracranial pressure, by which arterial ischæmia, venous hyperæmia, and serous transudation may be produced, together with general brain disturbance, and with the characteristic phenomena of arrested circulation (*Stauungsphänomen*) in the papilla. From the case related, and especially from the perfect function of the right eye, notwithstanding the complete engagement of its nerve in the tumour, he infers that the symptoms due to arrest of conducting power are of no very great value; and he suggests that the absence of other symptoms may have been due to the formation of the tumour at a very early period, even during foetal life, and to its very slow growth during the time of infancy, when the power of the bones and of the soft parts to accommodate themselves to its pressure would be considerable.

ON THE TREATMENT OF TRICHIASIS AND DISTICHIASIS.

By Dr. U. Herzenstein, of Odessa, Arch. f. O., xii, 1.

DR. HERZENSTEIN advocates the destruction of the hair bulbs by the inflammation caused by the presence of a thread of silk used as a seton. He introduces the point of a needle on the margin of the lid, near the outer commissure, carries it in a vertical direction, and brings it out through the skin, a line and a half or two lines from the puncture. The needle is reintroduced at the wound of exit, and carried along the surface of the tarsal cartilage, under the muscle and skin, in a horizontal direction, to emerge about the middle of the lid. Again reintroduced at the wound of exit, it is carried on in a horizontal direction over the remaining half of the cartilage, to emerge just on the outer side of the punctum. Again reintroduced at the wound of exit, it is carried vertically, and made to emerge on the margin of the lid. The two ends of the thread are fastened to the cheek by plaster, and the eye covered by a compressive bandage. The thread should be moved daily, after the manner of a seton; and removed about the seventh day, or whenever sufficient suppurative inflammation is excited. If the disease be partial, the seton may be so applied as to include only the bulbs of the offending hairs, instead of the whole margin of the lid. Dr. Herzenstein also

pulls out the eyelashes at the time of operation. He cites cases in support of the plan, and avers that it is perfectly successful, and that, when the inflammation has subsided, it produces no change in the shape of the eyelid or its margin. He advises the use of blue protective glasses after the hair bulbs are destroyed.

ON THE CORNEAL EPITHELIUM AND ON THE MULTIPLICATION OF ITS CELLS.

By Dr. C. Schalygen, of St. Petersburg, Arch. f. O., xii, 1.

THE author states that the corneal epithelium is arranged in three principal layers, of which the inner is composed of cells more or less columnar or wedge-shaped, standing vertically on Bowman's membrane, but penetrating into it to different depths, so that the general surface of the layer presents on both sides an irregular or indented outline. The cells are usually three or four cornered; and, when wedge-shaped, their points are directed externally. The middle layer consists of roundish, roundish oval, and angular cells, and the angles of many of the latter are more or less pointed and prolonged. The outer layer consists of flattened cells, which assume on the surface the aspect of plates or scales, and lie horizontally; while those of the middle layer are more or less oblique. All these cells contain nuclei; and the nucleus usually corresponds in form to the containing cell. The whole thickness of the epithelium is about $0.023''$ to $0.350''$, of which the largest portion is due to the inner, and the least to the external layer. The size of single cells ranges from $0.001''$ to $0.008''$; the largest being near the margin, the smallest near the centre of the cornea. The author proceeds to describe the effects of various reagents. The cells are distended by water and by dilute acetic acid, dissolved altogether by liquor potassæ, stained yellow by iodine, rendered granular by alcohol, hardened by Müller's fluid, and receive from solution of nitrate of silver a black deposit, by which their outlines and angles are rendered very clearly visible. Their multiplication takes place by partition commencing in the nuclei, and leading usually to the formation of two cells, sometimes of three, rarely of four. On this point the author speaks positively, from direct and repeated observation; and claims to set aside the contrary dictum of Henle.

REMARKS ON A CASE OF FRACTURE OF THE ORBIT.

By Prof. Manz, of Freiburg, Arch. f. O., xii, 1.

THE author observes that an additional case of fracture of the orbit would not be worth recording, unless it presented points of

special interest. It is usually assumed that the blindness which follows such an injury must either be produced directly, by violence done to the eyeball or optic nerve, or indirectly, by paralysis of the optic nerve consecutive to brain lesion. The latter supposition he believes to be incorrect; and he attributes the secondary blindness usually to inflammation of the optic nerve and retina.

A youth of 19 received a blow on his right eye from a bean stick. The immediate effects were ecchymosis, slight ptosis, slight deviation of the eye outwards, some dilatation of the pupil, and impairment of memory. Three weeks afterwards he received a blow on the head from his master, followed immediately by severe headache, and he came to Prof. Manz, a fortnight later. At that time he was feeble, pale, and tremulous, with an aspect of suffering, the right eye closed, and the levator paralysed. The inner angle of the orbit was tender to the touch. The eyeball deviated outwards about one line, and retained normal mobility, although its movements inwards and outwards were painful. The media and iris were natural. The ophthalmoscope showed considerable neuro-retinitis. The retina was universally turbid, the papilla of a dirty grey, its margins obscured and interrupted by radiating whitish streaks. The vessels were much dilated, winding, and here and there lost to view. In the left eye the veins seemed somewhat over full. Notwithstanding these changes, vision was little impaired. That of the left eye was normal, and the right read No. 4 of Jaeger readily at 10". The state of the patient rendered it impossible to test the field of vision. Two days later sickness and vertigo appeared, and the boy soon after died comatose. The autopsy revealed encephalitis and meningitis, with suppuration proceeding from a fracture of the roof of the orbit, and laceration and inflammation of the levator palpebræ, the superior rectus, and superior oblique. Within the eyeball, the disease was limited to the retina, or, as far as could be seen *post mortem*, to the optic disc and its immediate neighbourhood. The vessels were much enlarged, and from the disc itself projected a little excrescence, resembling the disc in colour and consistence. The morbid appearances stopped at the lamina cribrosa, and nothing abnormal could be discovered in the optic nerve or tract, other than some possible hypertrophy of the connecting element.

In some comments upon the case the author points out that the ptosis and the strabismus were effects of the direct injury sustained by the muscles, and were not paralytic; and that, if the patient had survived, the inevitable blindness would have been an effect of the neuro-retinitis discovered by the ophthalmoscope. He points out that neuro-retinitis may be of two kinds, the first due to inflammation of the connecting tissue, the second to obstruction of the venous outflow; and that these conditions (as in the instance under consideration) may be combined.

He considers the eye disease to have been produced, almost entirely, by the basilar meningitis—and to have had no connection with the inflammation of the brain substance, which was probably of earlier date.

HISTORICAL NOTE ON HYPERMETROPIA AND ASTIGMATISM.

By Dr. A. Nagel, of Tübingen, Arch. f. O., xii. 1.

DR. NAGEL quotes from a German translation of Janin's *Memoires et observations sur l'œil*, (Paris, 1772,) a complete description of a case of extreme hypermetropia, and a full recognition of the state of refraction to which the symptoms were due. He quotes also from an inaugural dissertation by G. H. Gerson, published at Göttingen in 1810, an account of a case of myopic astigmatism, with a reference of the phenomena to the different curvatures of the chief meridians of the cornea. He therefore claims for Janin the discovery of hypermetropia; and for Gerson a place between Young and Airy in the history of astigmatism.

ON A DOUBLE PLANO-CONVEX EYE-GLASS.

By Dr. Hugo Gerold, Arch. f. O., xii. 1.

DR. GEROLD describes a case of extreme hypermetropia, in which the eye was acutely sensitive to the slightest inaccuracy of correction, and in which he could find no single lens that fulfilled the indications; the lens of 4" focus being too weak for prolonged use of the eye, and that of 3·75" too strong. He therefore devised a combination of two plano-convex lenses, set in a screw frame, by which their distance apart, and hence the focal length of the combination could be slightly varied. The lenses were respectively of 6" and of 12" focal length; the plane surface of the 12" nearest the eye, the plane surface of the 6" towards the convex surface of the 12". When the lenses were in contact, the focal length of the combination was 4"; and by separating them this focal length was diminished. The combination fully answered the purpose expected from it, and the author gives a formula, by which the power of the second lens may be calculated for any given combination. For example, if a combination of three inch focal length be required: that is,

$$\frac{f' f}{f' + f} = 3; \text{ and if a lens of } 18'' \text{ be taken as one of the pair;}$$
then :—

$$\begin{aligned}\frac{18x}{18+x} &= 3 \therefore \\ 18x &= 54 + 3x \therefore \\ 15x &= 54 \therefore \\ x &= 3.6; \text{—and} \\ \frac{3.6 \times 18}{3.6 + 18} &= \frac{64.8}{21.6} = 3.\end{aligned}$$

So that the focal length of the second lens must be 3.6". The same formula will serve for every combination that can be needed.

ON THE CENTRE OF THE CRYSTALLINE LENS OF THE FROG.

By Dr. C. Ritter, of Oberndorf, Arch. f. O., xii, 1.

THE author commences by saying that he made some researches into the microscopic structure of the lens for the *Etudes Ophthalmologiques* of Dr. Wecker; but that time did not allow him to complete them to his satisfaction. His attention has since been specially directed to the centre of the lens in the frog; and he has obtained the following results:—The outer fibres of the lens are exactly semicircular with pointed terminations, and extend from end to end of its axis. This arrangement is continued inwards, layer after layer, concentrically, until the fibres of the inner layers do not exceed 0.003 mm. in length. These inner fibres become rather elliptical than semicircular, the long axis of the ellipse corresponding with the axis of the lens. Within the space enclosed by the smallest elliptical fibres is a central body composed of short fibres, each containing one well marked nucleus. These nucleated fibres are from 0.0015 to 0.0025 mm. in length, and present very irregular outlines. Their long axes are nearly parallel to the axis of the lens; but they are irregularly packed together. Between them and the ordinary non-nucleated fibres are found irregular fibres like the former, but themselves non-nucleated, and with pointed terminations. The author thinks it probable that an analogous plan of structure may be found in other animals; and suggests that such an assemblage of irregularly packed nucleated fibres would impair the transparency of the geometrical centre of the lens, and may thus supply a reason why the geometrical centre is placed externally to the axis of vision.

CASE OF INSUFFICIENCY OF THE EXTERNAL AND INTERNAL OCULAR MUSCLES.

By Dr. Leopold Kugel, of Bucharest, Arch. f. O., xii, 1.

DR. KUGEL was consulted by a youth of 18, student at a military college, on account of an increasing asthenopia that

almost entirely prevented any use of the eyes. There was no failure of accommodation, and in each eye a very slight degree of simple hypermetropic astigmatism, wholly insufficient to explain the symptoms. Attention was then directed to the muscles, and it was found that:—

The patient saw any object, *e.g.*, a taper flame, singly, only when it was between 14 and 42 inches from his eyes, in the median line. When the object was nearer than 14" the double images were crossed, when further than 42" they were homonymous. This space, from 14" to 42" may be called the range of single vision. The more its limits were exceeded in either direction, the greater the distance between the images. The interval was purely one of lateral distance, the images shewing no upward or downward movement, and never being inclined. The supposition of insufficiency of both lateral muscles was confirmed by further investigation. The use of prisms shewed that the insufficiency of the external muscles was more marked than that of the internal. It was found that an equilibrium of lateral tension was established by looking at an object 34 inches distant, and, when the instinctive dislike of double vision was subdued by a deeply coloured glass before one eye, it was at this distance *only* that single vision existed. A movement of the object for a single inch, either backwards or forwards, produced two images. In looking at a flame 34 inches distant the patient could overcome a prism of 6° , and for a short time one of 8° , with the base external; but scarcely one of 4° , with the base internal. Using either eye only, the patient was normal sighted, but using both together he was only normal sighted over the already mentioned range of single vision; as soon as this range was overpassed the diminution of vision was extraordinary. Thus Snellen, No. 100, could scarcely be recognized at 6", and fingers could not be counted at 8'. After various other details of the condition have been described, the author enumerates the following possible modes of treatment:—Exclusion of one eye from vision by an opaque glass, convex spectacles, prisms, prisms in combination with convex lenses, and, lastly, displacement (forwards) of the muscles by operation. Deeming the exclusion of one eye to be very objectionable, he is now making trial, for near vision, of prisms of 4° , with bases internal, in combination with 16" convex lenses; and, for distant vision, of prisms of 6° , with bases external, in combination with 20" convex lenses. If these should fail, operative interference will be recommended.

CORRECTION.

Dr. Mackenzie has drawn my attention to an inaccuracy in the précis of No. 12 in the "Tabular Statement of Cases of Cysts in the Iris," contributed by me to the last number of this Journal.

Dr. Mackenzie's narrative of this case (On the Diseases of the Eye. Ed. 4, p. 704) does not mention the cause of the formation of the cyst. The immediately preceding paragraph in his work does not refer to this case, but to another, described at page 395, in which the cornea had been punctured with one of the points of a pair of compasses.—J. W. HULKE.

IMPORTANT ENLARGEMENT OF THE MOOR-FIELDS HOSPITAL.

It may interest many of our readers to know that it is in contemplation to make some important and extensive additions to the Royal London Ophthalmic Hospital, Moorfields. The number of applicants for relief have nearly doubled during the last ten years, and the want of suitable accommodation has become more and more evident. The appeals that have been made from time to time have been nobly responded to by the City, by several of the public Companies, and by our merchants, bankers, and others; and a sum has been raised that enables the Committee of Management to commence the new building, the plans for which can be seen at the Board Room of the Hospital. These additions will more than double the present accommodation for in-patients. There will also be some important improvements in that part of the building devoted to the purposes of instruction. There will be a roomy and well-contrived series of compartments for the use of the ophthalmoscope, where students can simultaneously pursue their studies in this most important department. A new museum, library, and lecture room are to be added, together with a larger and more convenient operating theatre. The Curator will thus be better able to store up and arrange for the purposes of instruction the numerous interesting morbid specimens continually accruing. Courses of lectures and demonstrations will be given by different members of the staff, so as to bring these various facilities for instruction into full practical operation. It is fully expected that all these important alterations will be completed during the present year.